VET-PRO VIP 2000™

Color Vision

Veterinary Infusion Pump System
Operator Manual

CME
Caesarea Medical Electronics

$C \epsilon$ **0344**

Caesarea Medical Electronics Ltd.
16 Shacham street
Industrial Park Caesarea North
P.O.Box 4294 Caesarea 38900, Israel
E: sales@cme-infusion.com
W: www.cme-infusion.com

| EC | REP |

MedNet GmbH.
Borkstrasse 10
48163 Muenster
Germany
T: +49 251 32266 0

☞   NOTE: *To assure proper use of the VET-PRO VIP 2000™, Caesarea Medical Electronics Ltd. urges all users to read this manual carefully, become familiar with the procedures and system functions and follow all recommendations.*

⚠ *Using the pump with air in line detector off may cause an embolism resulting death or paralysis. Switching the air detector off is not recommended and should be used only when absolutely necessary. Please contact your technician in order to enable the air sensor if disabled with no need.*

⚠   U.S.A. federal law restricts this device to sale by or on the order of a physician.

Table of Contents

1- Introduction

Overview

The *VET-PRO VIP 2000*™ system provides the following features:

● Small, light and compact pump.

● Multiple Programs:

1. **Continuous**
Infusion Rate: 0.1 to 1200 ml/hr
Volume: 0.1 to 99.9 ml in 0.1ml increments or
1 to 9999 ml in 1ml increments
Secondary Infusion (Piggy) programmable with the same infusion rate and volume capabilities as the primary continuous infusion.

2. **Drug Library**
Continuous program, as above, comprises 128 drug protocols based on patient data. Protocols have hard and soft limits for added patient safety.

3. **Intermittent**
A set dose delivered in set intervals. Between Intervals the pump will keep vain open (KVO Mode).

4. **TPN**
Total Parenteral Nutrition Rate Taper program with programmable up and down times.

5. **PCA**
Patient Control Analgesia: Continuous delivery plus /or programmed boluses.
Bolus Volume: 0-25.5 ml
Clinician Bolus Volume: 0.1-100ml
Bolus Rate: 0.1-1200 ml/h

6. **25 Steps**
Operator can design a specific protocol for drug delivery which contains up to 25 steps.
Infusion Rate: 0.1 to 1200 ml/hr
Volume: up to 9999ml, for each step
Accumulated Volume for all steps – up to 10 liters, or in volume over time mode.

● Highly accurate fluid delivery

● Operated with a custom safe administration set

● Rechargeable internal lithium-Polymer battery or alkaline 2X9V batteries

● Battery charged in a pole mount charging cradle or with an A/C adaptor

● Quiet operation

● AEA – Suitable to be used in ambulances.

Keypad Description and Functions

Front of *VET-PRO VIP 2000*™ Infusion Pump
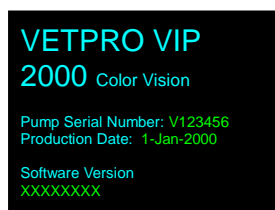
1. Display Screen

- Displays pump and infusion status
- Displays programming choices and instructions

2. STOP/NO

- Stops infusion
- Silences an alarm condition
- Pause priming
- Zeroes the displayed value during programming

3. START/ OK

- Starts infusion
- Confirms selection and setting

4. PRIME/BOLUS

- Pressing Prime/Bolus key *during data setting*: Enables Priming procedure. A graph appears on the display screen showing the priming volume with the current value increasing until reaching the set volume**.**
- Pressing Prime/Bolus key during *Continuous p*rogram operation: Enables bolus Infusion**.**
- Pressing Prime/Bolus key during *PCA* program operation: Enables bolus procedure**.**

5. Power ON/OFF

- Turn the system ON by pressing and holding the button until the Self-Test screen appears.
- Turn the system OFF by pressing and holding the button until the graph is red and a beep is generated.

6. Lock Operation

- Will lock keys to prevent settings changes.

7. INFO

- Supplies information about the pump and its programs (see Info Mode chapter).

8. Numeric Keys

- Enters numeric parameters during programming.

9. Arrows

- Scrolls up, down, right and left through options.

10. Operation LED

- *Green Indicator*
  - Lights during system Self-Test
  - An intermittent green light indicates infusion delivery
- *Red Indicator*
  - Indicates an alarm state with a continuous red light

VET-PRO VIP 2000™
Pump with Open Door

	Area	Function
1.	Latch Holder	Holds the door closed when latch is in vertical position.
2.	Flow Direction	Shows direction of pump operation
3.	Pressure Sensor	Detects downstream tubing restriction and occlusion. Alarm level can be adjusted to suit patient needs.
4.	Pressing Plate	Connected to the door by two springs
5.	Pump Door	Covers the pressing plate
6.	Air sensor – Front	Ultrasonic air detector, which is mounted on the front housing.
7.	Air sensor - Door	Mounted on the door

Pump Charger

	Area	Function
1.	Charger Display	Displays major pump messages and operation values
2.	Release Handle	Push to release the pump from the charger
3.	Charger LED (orange)	Indicates connection to mains
4.	Pump Battery LED (red/green)	Indicates battery charge status

System Safety Checks

The following details outline the safety checks designed into the *VET-PRO VIP 2000*™ infusion system, to minimize the possibility of under or over infusions.

Free Flow Protection (Optional)

CME's customized IV lines are equipped with a check valve (BodyValve™) that prevents free flow towards the patient when the IV line is not attached to the pump. When the pump is attached to the IV line and delivering fluid, the pressure delivered by the pump opens the valve. The valve is also one way valve preventing fluid flow from the patient back to the administration line.

Air-in-Line Accumulation

To improve the detection of air in the IV line, the *VET-PRO VIP 2000*™ Infusion system utilizes an air-in-line accumulation system in addition to the standard single bubble detection. This feature monitors the volume of air that passes through the IV line by accumulating the volume of individual bubbles over any 15 minutes period. This limit is not configurable. Although an individual bubble may not exceed the pre-programmed threshold, if the cumulative volume of smaller bubbles exceeds 1ml over a period of 15 minutes an air-in-line alarm is initiated. This accumulation feature is particularly useful with infusions for patients who are highly sensitive to air (i.e. infants, neonates, children) or when infusing products that create significant volumes of small air bubbles.

Anti-Bolus Function

The anti-bolus function is designed to reduce the bolus that may occur upon the release of an occlusion following a downstream occlusion alarm. Upon the detection of a downstream occlusion, the alarm is activated and the pump returns the IV line pressure to neutral within 15 seconds. Neutral line pressure is achieved by the reverse operation of the pumping mechanism, and measurement of the IV line pressure through the in-line pressure detection system.

Pump Accuracy

The following graphs and curves were derived from testing described in IEC60601-2-24. Testing was performed under normal conditions at room temperature (72^0 F). Any deviations from normal conditions and room temperature may cause changes in the accuracy of the pump.

Start-up Curves

The Start-up curves represent continuous flow versus operating time for two hours from the start of the infusion. They exhibit the delay in onset of delivery due to mechanical compliance and provide a visual representation of uniformity. Trumpet curves are derived from the second hour of this data. Tests performed according to IEC 60601-2-24 standard.
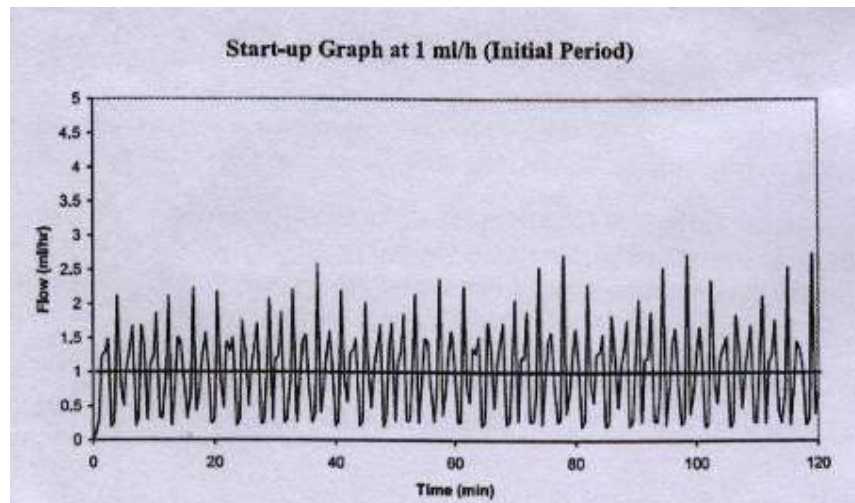
Trumpet and Flow Rate

With the *VET-PRO VIP 2000™*, as with all infusion systems, the action of the pumping mechanism and variations cause short term fluctuations in rate accuracy.

The following curves show typical performance of the system in two ways:
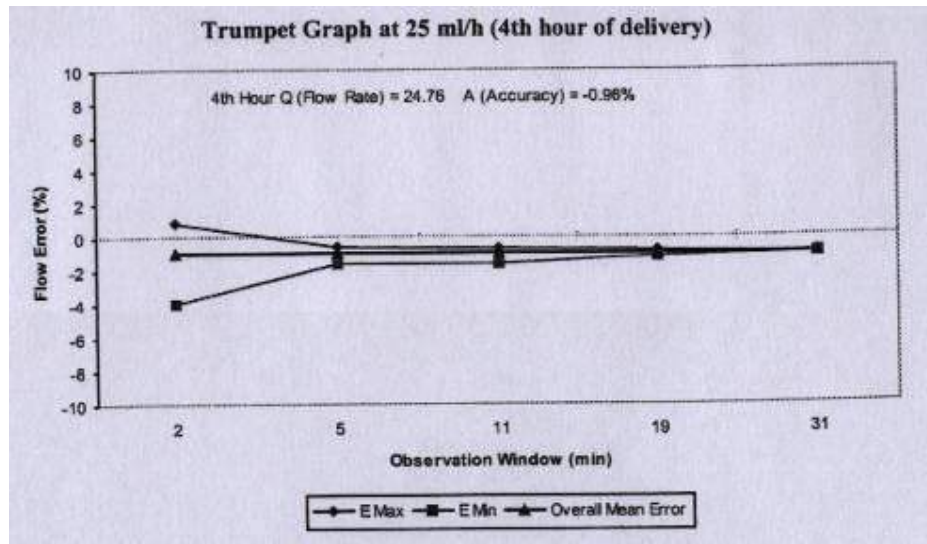
1. The accuracy of fluid delivery over various time periods is measured (trumpet curves).
2. The delay in onset of fluid flow when infusion commences (start up curves).

Trumpet curves are named for their characteristic shape. They display discrete data averaged over particular time periods or "Observation windows", not continuous data versus operating time. Over long observation windows, short-term fluctuation has little effect on accuracy as represented by the flat part of the curve. As the observation window is reduced, short-term fluctuations have greater effects as represented by the "mouth" of the trumpet.

Knowledge of system accuracy over various observation windows may be of interest when certain drugs are being administered. Short-term fluctuations in rate accuracy may have clinical impact depending on the shelf life of the drug being infused and the degree of inter-vascular integration. The clinical effect cannot be determined from the trumpet curves alone.

Trumpet Graph at 1 ml/h (2nd hour of delivery)

Trumpet Graph at 1 ml/h (4th hour of delivery)

Start-up Graph at 25 ml/h (Initial Period)

Trumpet Graph at 25 ml/h (2nd hour of delivery)

2nd Hour Q (Flow Rate) = 24.64   A (Accuracy) = -1.44%

Trumpet Graph at 25 ml/h (4th hour of delivery)

4th Hour Q (Flow Rate) = 24.76   A (Accuracy) = -0.96%
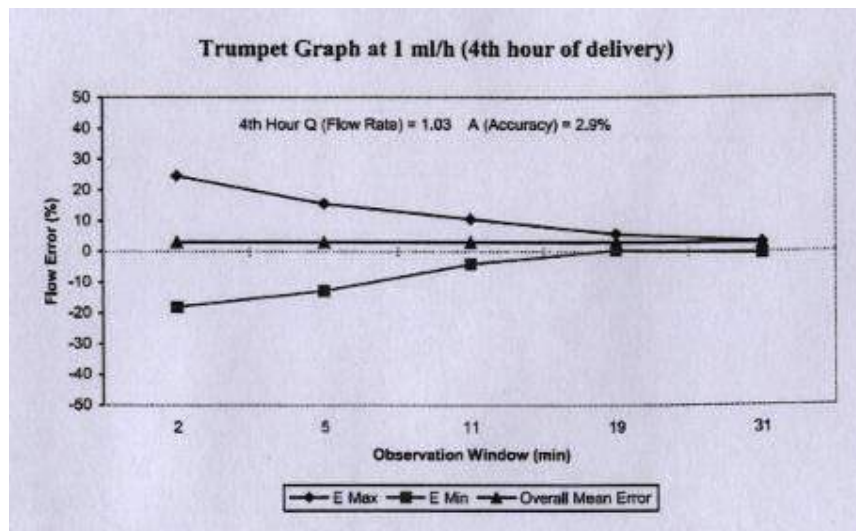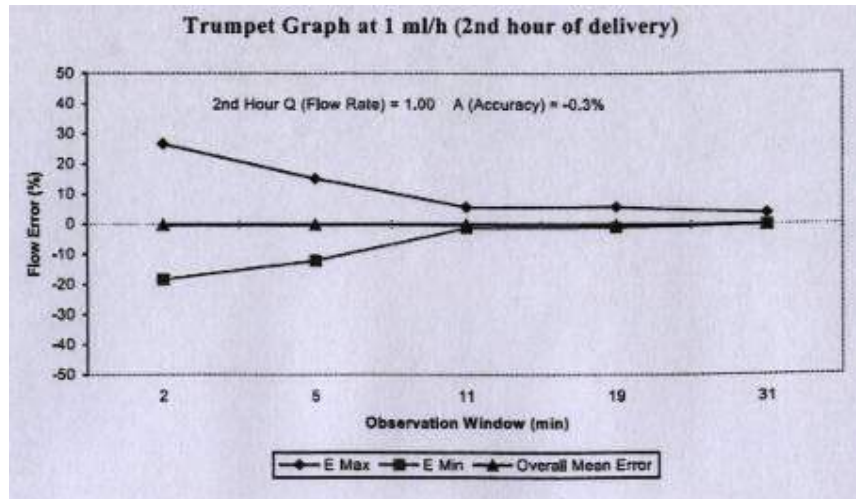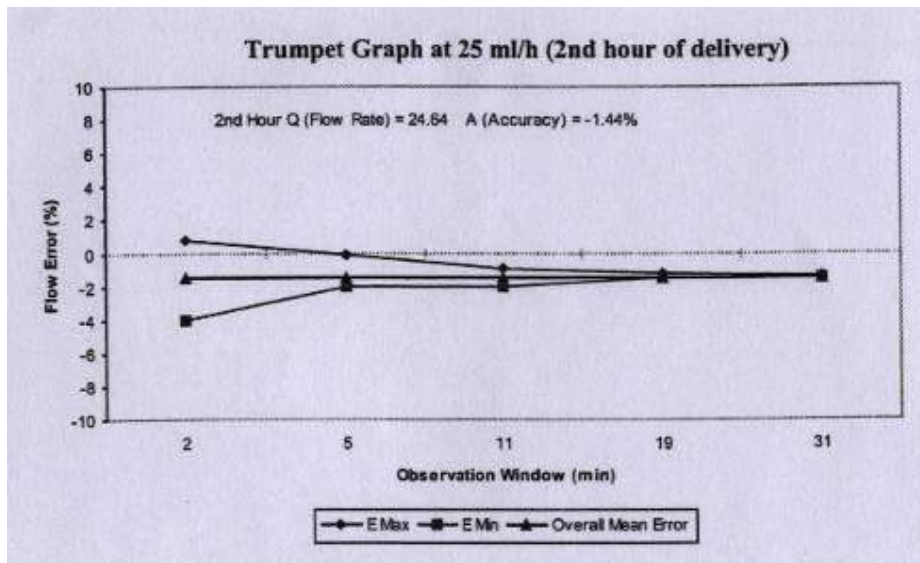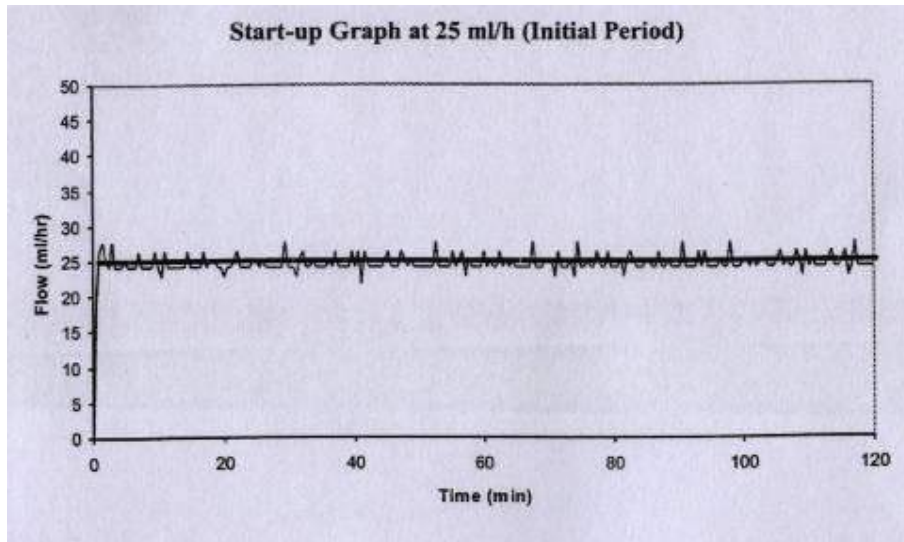
2 – Symbols, Warnings and Cautions

System Symbols

The following symbols are used on the *VET-PRO VIP 2000™* infusion system and components. Labels on the system or statements in this manual proceeded by any of the following words and/or symbols are of special significance and are intended to help you to operate the pump in a safe and successful manner.

Attention, consult accompanying Instructions

Attention, refer to operating instructions

CE mark indicates conformance to Medical Device Directive 93/42/EEC

Do not dispose of in municipal waste. Symbol indicates separate collection for electrical and electronic equipment. (WEEE Directive 2002/96/EEC). NOTE: Does not apply to the battery.
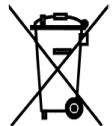
Do not dispose of battery in municipal waste. Symbol indicates separate collection for battery is required.

The use of single-use disposable components on more than one patient is a biological hazard. Do not reuse single-use disposable components.

Type CF applied part

Date of Manufacture

Serial Number

Expiry Date of disposable

Lot Number

Sterilized with Ethylene Oxide

Terms Used In Manual

! **Warning:** Indicates that the information is a warning. Warnings advise you of circumstances that could result in injury or death to the patient or operator.
Read and understand this manual and all warnings completely before operating the *VET-PRO VIP 2000*™ infusion system.

! **Caution:** Indicates that the information is a caution. Cautions advise you of circumstances that could result in damage to the device.
Read and understand this manual and all cautions completely before operating the *VET-PRO VIP 2000*™ infusion system.

☞ NOTE: Indicates that the information that follows is additional important information or a tip that will help you operating the *VET-PRO VIP 2000*™ infusion system.

Intended Use

The *VET-PRO VIP 2000*™ infusion pump system is designed for infusion of medications or fluids requiring continuous or intermittent delivery at precisely-controlled infusion rates through clinically acceptable routes of administration, including intravenous, subcutaneous, percutaneous, intra-arterial, epidural, enteral, in close proximity to nerves, and into an intraoperative site (soft tissue/body cavity/surgical wound site). The system is intended for patients who require maintenance medications, analgesics, PCA therapy, parenteral and enteral nutrition fluids, chemotherapeutic agents, blood or blood products infusion, and general fluids therapy in hospital and home care environments.

Warnings

To avoid possible personal injury or loss of life, observe the following:

! Using the pump with air in line detector off may cause an embolism resulting death or paralysis. Switching the air detector off is not recommended and should be used only when absolutely necessary. Please contact your technician in order to enable the air sensor if disabled with no need.

! Read the entire Operation Manual before using the pump, since the text includes important precautions.

! The maximum volume that may be infused under SINGLE FAULT CONDITION is 0.1 ml

! Voltage present on internal components may cause severe shock or death upon contact. Disconnect the Charger from the mains, prior to opening the casing. Only trained service personnel should open the pump cover.

! Blown fuses could cause a fire hazard. Replace blown fuses on the Charger only with fuses of the same type and rating (see fuse values on the Charger PCB).

! Boluses will be infused up to the full volume that is requested unless the user stops the bolus manually by pressing **STOP NO**. This is true even when the volume infused is less than the specified Hour Limit for Volume (e.g. 4 Hr Limit) at the beginning of a bolus and goes over the limit during the bolus (to complete it).

! Make sure the pump is attached securely to the Charger, which is connected firmly to an IV pole.

⚠ A kinked or occluded IV line may impair the operation of the pump and the accuracy of the infusion. Before operation, verify that the IV line is not kinked or occluded.

⚠ Drugs must not be administered to the epidural space unless the drugs are indicated for this purpose and are administered in accordance with the indications included in the manufacture's package. Epidural administration of drugs other than those indicated for epidural use could result in serious injury to the patient. For epidural administration of drugs use *MicroSet*™ only.

⚠ Any adjustments, maintenance, or repair of the uncovered pump may impair the operation of the *VET-PRO VIP 2000*™ infusion system and/or the accuracy of the infusion. Any adjustments, maintenance, or repair of the uncovered pump or charger should be performed by authorized skilled technicians. Any adjustments, maintenance, or repair of the uncovered pump or charger while connected to the power should be avoided.

⚠ The *VET-PRO VIP 2000*™ infusion system should be operated within a temperature range of 18°C (59°F) to 45°C (113°F) and up to 85% humidity. Operating the pump at temperatures and/or humidity other than within that range may affect accuracy.

⚠ Unsafe operation may result from using improper accessories. Use only accessories and options designed for this system.

⚠ Disposables must be compatible with the medicine delivered.

⚠ Battery charging is enabled as long as the charger cord is connected to the mains and the pump is in the charger. Switching the pump off does not disconnect it from the mains. To disconnect from mains, remove the charger cord from mains. To disconnect pump from mains, remove it from the charger.

⚠ Dropping the *VET-PRO VIP 2000*™ infusion system could cause damage to components. If the pump is dropped, return the pump for inspection by qualified service personnel.

⚠ Use aseptic technique. Patient infection may result from the use of non-sterile components. Maintain sterility of all disposable components and do not re-use single use IV sets.

⚠ Watch your fingers and nails when opening the pump door.

⚠ When operating the pump on PCA program with a rate of 0.0 ml/h there is a hazard of blood clot forming. Connect saline infusion in parallel to avoid this problem.

⚠ When operating the pump on PCA program, the program will not enter KVO, even if the limit volume is acceded. The program will complete the bolus and then enter KVO.

⚠ Do not operate the pump near high-energy radio-frequency emitting equipment, such as electro-surgical cauterizing equipment. False alarm signals may occur.

⚠ Do not let the pump operate when battery is fully depleted. Pump may turn off during operation on fully depleted battery without alarm.

⚠ Never operate the pump without performing the battery test as described in chapter 4 in this manual.

⚠ Pump should be stored with the battery connected, otherwise the internal rechargeable battery may lose track of actual time.

⚠ Do not use the *VET-PRO VIP 2000*™ for infusion of Insulin.

⚠ Infusion of blood or blood products should be restricted to maximum rate of 600ml/h.

Cautions

To avoid possible damage to the equipment, observe the following:

⚠ Leaving the battery in a depleted state for a long period of time may damage the battery. Connect the pump to the mains via the Charger whenever possible to recharge the battery.

⚠ Do not store the pump with the battery fully depleted.

⚠ Xylene, Acetone or similar solvents could cause damage to components. Do not clean the pump with these chemicals. Clean solution spills on the pump immediately. Use a damp cloth or sponge. A mild detergent may be used. Wipe thoroughly with a dry cloth.

⚠ Immersing the *VET-PRO VIP 2000*™ infusion pump into liquid could cause damage to components. Do not immerse the pump into any type of liquid.

⚠ Battery damage could occur if left in a temperature warmer than 50^0C ($122°$F).

3 – Installation and Set up

Unpacking

1. Carefully remove the pump and Charger from the box.

2. Make sure no items were damaged during shipment

3. Make sure you have the following items:

   - *VET-PRO VIP 2000™ infusion pump*

   - *Charging Cradle with Power Cord or Battery Charging Cable*

   - *Rechargeable Battery Pack 1800mAh*

   - *Operation Manual*

   - *PCA bolus cable (optional)*

   - *9V Alkaline Battery compartment (optional)*

   - *Disposable Battery Pack (optional)*

   - *External charger (optional)*

   - *Extended life battery Li- Polymer 3600 mAh (optional)*

If any items are missing or damaged, contact your *VET-PRO VIP 2000™* supplier.

Charging the Pump

☞ NOTE: The pump is protected against overcharging. In order to keep your battery fully charged, connect the pump to the mains via the Charger whenever possible. Be sure that the battery is fully charged at all times.

⚠ **Warning:** If the battery is removed during operation while pump is not connected to a charger connected to mains, the pump will turn off.

1. Connect the charger unit to AC power and verify that the AC indicator is lit.

2. Put the pump into the charger (top first) until it clicks into place.

3. The battery is charging when the red battery LED on the front of the charger is lit. The battery is fully charged when the battery LED symbol turns green. If the LED does not light or does not turn green after more than 8 hours, pls. replace battery.

4. Remove the pump from the charger by pressing the release button (located next to the LED indicators on the charger) and lift the pump out of the charger bottom first.

⚠ **Caution:** Leaving the battery fully depleted for a long period of time may damage the battery.

4 – Operation

Before Operating the Pump

Before attaching the system to a patient, run the following tests to verify that all indicators and alarms work properly.

When an alarm is activated the following occurs:

- Infusion ceases
- An audible alarm sounds
- An alarm message appears on the display
- The LED changes from green to red

☞ NOTE: All tests should be performed in the Continuous program.

Pump Operation Test

1. Click the pump into a Charger connected to AC power. Verify that the CHARGE indicator is on, Red or Green light (on charger).

2. Insert an administration set and close the door. Press the door until a click is heard.

☞ NOTE: For instructions on how to load and prime an administration set refer to sections "Loading the Administration Set" & "Priming the Line".

3. Press **ON OFF** until the Self-Test screen appears. If air sensor is off, press **START OK** to confirm.

4. The program selected and its status are displayed. During the Self-Test a long beep will be heard. This procedure verifies that the pump's acoustic and visual features are working properly. After self test is completed, the display will show the last rate setting.

5. Press **PRIME BOLUS** to prime the IV line.

⚠ **Warning:** Ensure the set is not connected to a patient!
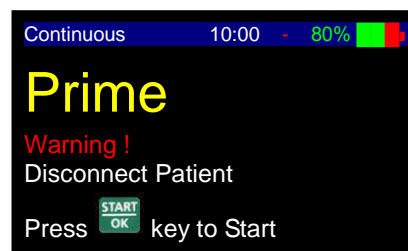
Continuous	10:00	-	80%

Prime

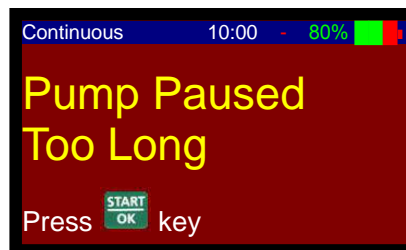Warning !
Disconnect Patient

Press **START OK** key to Start

6. Enter the Volume of fluid required to prime the set and press [START OK] to begin priming procedure. You may stop priming at any time by pressing [STOP NO].

Continuous   10:00   -   80%
Prime Volume
5 mL
Press [START OK] key to Start

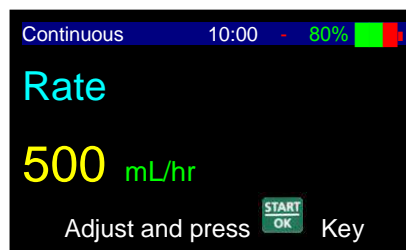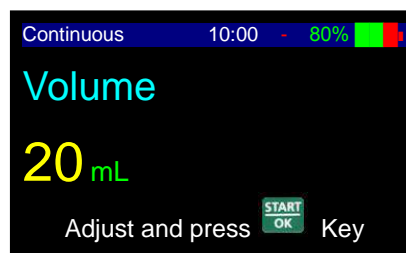7. The display screen will show a graph indicating the prime operation.

Continuous   10:00   -   80%
Priming
1   5mL
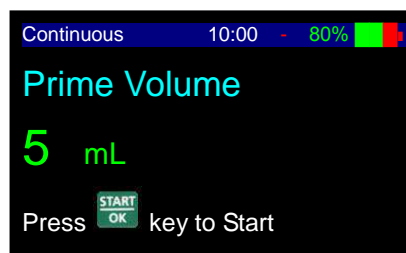
8. When priming is completed, wait two minutes without pressing any key. After two minutes the screen displays "Pump Unattended" and an alarm will sound. Press [STOP NO] to silence the alarm again or [START OK] to exit alarm condition.

Continuous   10:00   -   80%
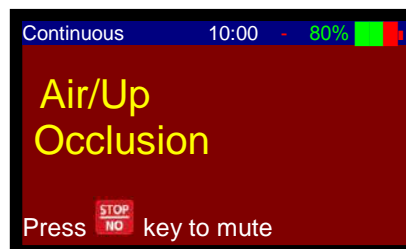**Pump Paused Too Long**
Press [START OK] key

Air in Line – Alarm Test

1. Insert an administration set and close the pump door. Press the door until a click is heard.

☞ NOTE: For instructions on how to load and prime an administration set refer to sections "Loading the Administration Set" & "Priming the Line".

2. Press [ON OFF] until the Self-Test Screen appears. If air sensor is off, press [START OK] to confirm. Please contact your technician in order to enable the air sensor if disabled with no need.

3. The pump displays the program selected and its status. The display will automatically change to display the last rate setting.

4. Change the infusion mode to Continuous (See "Change Set up" Section for instructions). Set the infusion rate at 500ml/hr, using the Numeric keypad and press [START OK] to confirm setting.

Continuous   10:00   -   80%
Rate
500 mL/hr
Adjust and press [START OK] Key

5. Set Volume at 20 ml and press [START OK] to start operation.

Continuous   10:00   -   80%

Volume

20 mL

Adjust and press [START OK] Key

6. Insert air into the IV line to allow an air bubble greater than 10 mm to enter into the administration set.

7. Air in line alarm will be activated as soon as the air bubble enters the set segment located behind the pump door.

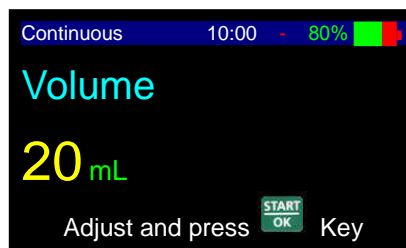   Press [STOP NO] to turn the alarm off.

Continuous   10:00   -   80%

Air/Up Occlusion

Press [STOP NO] key to mute

Down Occlusion – Alarm Test

1. Insert an administration set into the pump and close the door. Press the door until a click is heard.

2. Make sure room temperature is 21-23 °C

☞ NOTE: For instructions on how to load and prime an administration set refer to sections "Loading the Administration Set" & "Priming the Line".

3. Press [ON OFF] until the Self-Test screen appears. If air sensor is off, press [START OK] to confirm. Please contact your technician in order to enable the air sensor if disabled with no need.

4. The pump displays the program selected and its status. The display will automatically change to display the last rate setting.

5. Change the infusion mode to Continuous (See "Change Set up" Section for instructions). Set the infusion rate at 500 ml/hr using the Numeric keypad and press [START OK].

Continuous   10:00   -   80%

Rate

500 mL/hr

Adjust and press [START OK] Key

6. Set Volume at 20 ml and press [START OK] to start operation.

Continuous   10:00   -   80%

Volume

20 mL

Adjust and press [START OK] Key

7. Wait 5 minutes and then connect a pressure gauge at a distance of 1 meter from the exit of the pump. Place both the pump and the pressure gauge at the same level (on a table)

8. Wait another 5 minutes and occlude the IV line downstream of the pump (between the pump and the pressure gauge).

9. The Down Occlusion alarm occurs at the time and rates listed below (time is measured from actual occlusion time to alarm, with accuracy of +30% -20%):
   - 500 ml/h up to 20 seconds
   - 60 ml/hr up to 1 minute
   - 1 ml/hr up to 80 minutes
   - 0.1 ml/hr up to 11 hours

☞ NOTE: The pressure threshold can be changed to suit patient need (refer to section on changing the current default Pressure Limit).

10. Depending upon the set flow rate and pressure threshold, the Down Occlusion alarm will be activated.

> Continuous   10:00   -   80%
>
> **Down Occlusion**
>
> Check Line
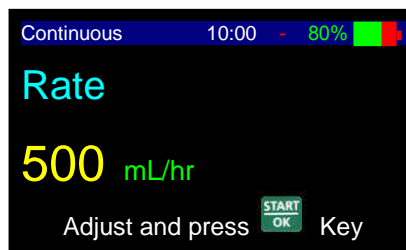> Press [STOP NO] key to mute
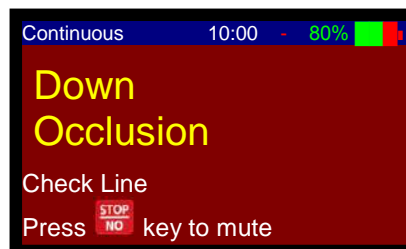
11. Press [STOP NO] to mute the alarm.

Door Open – Alarm Test

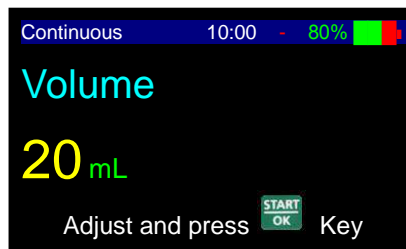1. Insert an administration set in the pump and close the door. Press the door until a click is heard.

☞ NOTE: For instructions on how to load and prime an administration set refer to sections "Loading the Administration Set" & "Priming the Line".

2. Press [ON OFF] until the Self-Test screen appears. If air sensor is off, press [START OK] to confirm. Please contact your technician in order to enable the air sensor if disabled with no need.

3. The pump displays the program selected and its status. The display will automatically change to display the last rate setting.
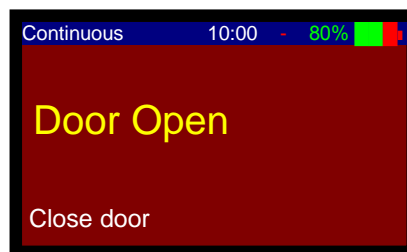
4. Change the infusion mode to Continuous (See "Change Set up" Section for instructions). Set the infusion rate at 500ml/hr using the Numeric keypad and press [START OK].

> Continuous   10:00   -   80%
>
> **Rate**
>
> **500** mL/hr
>
> Adjust and press [START OK] Key

5. Set Volume at 20 ml press [START OK] to start operation.

> Continuous   10:00   -   80%
>
> **Volume**
>
> **20** mL
>
> Adjust and press [START OK] Key

6. Open the pump door.

7. Door Open alarm will be activated at once.

| Continuous | 10:00 | - | 80% |

Door Open

Close door

8. Close the door and press [START OK].

Battery Test

1. Insert an administration set in the pump and close the door. Press the door until a click is heard.

☞ NOTE: For instructions on how to load and prime an administration set refer to sections "Loading the Administration Set" & "Priming the Line".
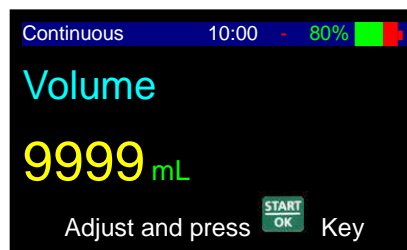
2. Take the pump out of the charger.

3. Press [ON OFF] until the Self-Test screen appears. If air sensor is off, press [START OK] to confirm. Please contact your technician in order to enable the air sensor if disabled with no need.

4. The pump displays the program selected and its status. The display will automatically change to display the last rate setting.
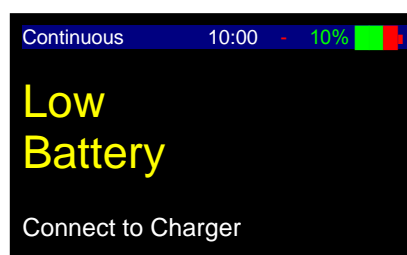
5. Change the infusion mode to Continuous (See "Change Set up" Section for instructions). Set the infusion rate at 1200 ml/hr using the Numeric keypad and press [START OK].

| Continuous | 10:00 | - | 80% |

Rate

1200 mL/hr

Adjust and press [START OK] Key

6. Set Volume at 9999 ml and press [START OK] to start operation.

| Continuous | 10:00 | - | 80% |

Volume

9999 mL

Adjust and press [START OK] Key

7. Wait untill pump displays "low battery" message

Continuous	10:00	- 10%	

Low
Battery

Connect to Charger

8. Press [ON OFF] to turn the pump off.

9. Connect the pump to a charger.

10. Verify the red icon of battery is lit (on the charger).

11. Verify the red battery turns green after a **minimum** of 2 hours.

⚠ **Warning:** Do not let the pump operate when battery is fully depleted. Pump may turn off during operation on fully depleted battery without alarm.

Charger Indicator Test

1. Click the pump into the IV pole charger and connect the Charger to mains. Disconnect the power cord from the AC power outlet.

2. Verify that the CHARGE indicator is OFF.

3. Connect the power cord to the AC power outlet. Verify that the CHARGE indicator is ON.

Loading the Administration Set

☞   NOTE: Follow the instructions supplied with the individual administration set.

⚠   **Warning:** Use of low quality administration set may impair the operation of the pump and the accuracy of the Infusion.
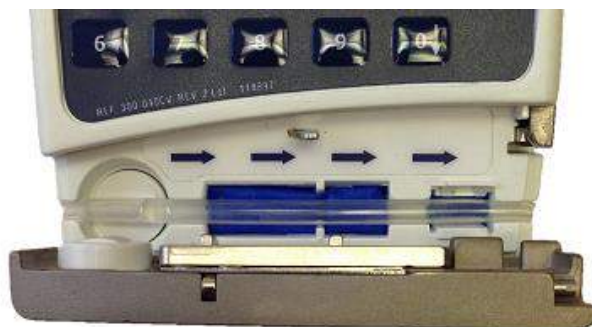
1.   Lift the door latch (on the right side of the door) to open the *VET-PRO VIP 2000™* pump door and remove the administration set from the sterile packaging leaving the end caps on the line until the moment of connection.

2.   Connect the administration set to the medication bag.

3.   Hold the section of tubing that you intend to load and make sure the flow direction is in line with the flow direction arrows inside the pump door.

4.   Insert the IV tubing into the canal designed for it as shown by the arrow in diagram 1. Insert the tubing from left to right with the shorter end connected to the medication bag on the left, and avoid stretching or pulling the tubing.

5.   Close the pump door until the catch clicks.

☞   NOTE: Ensure that the tubing is inserted completely into the pumping canal.

⚠   **Warning:** Use aseptic technique. Patient infection may result from the use of non-sterile components. Maintain sterility of all disposable components and use only once single use consumables marked ⊗ .

Priming the Line

Prime function is used:

1.   Before starting a program

2.   After air in line alarm

⚠   **Warning:** Always disconnect IV tubing from patient before starting priming procedure.

☞   NOTE: The default priming flow rate is 600 ml/hr. During priming, the air in line alarm is disabled.

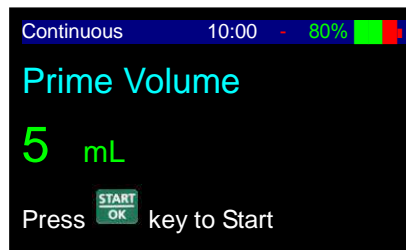# Prime – In Continuous, Intermittent, TPN , and 25 Steps Modes

☞ NOTE: Access to the priming procedure in PCA mode is different from all other programs. For detailed instructions, refer to PCA Operation section.

1. Turn on the *VET-PRO VIP 2000™* pump, by pressing [ON OFF] until the Self-Test screen appears. If air sensor is off, press [START OK] to confirm.

2. When the display screen shows the existing programmed rate press [PRIME BOLUS] once.
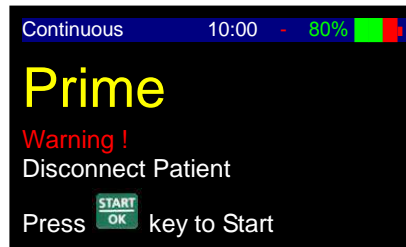
Continuous	10:00	-	80%
Prime			
Warning !			
Disconnect Patient			
Press [START OK] key to Start			

⚠ **Warning:** Ensure the set is not connected to the patient!

3. Enter the Volume of fluid required to prime the set and press [START OK] to begin priming procedure. You may stop priming at any time by pressing.

Continuous	10:00	-	80%
Prime Volume			
5 mL			
Press [START OK] key to Start			

4. The display screen will show a graph indicating the prime operation.

Continuous	10:00	-	80%
Priming			
1			5mL

5. Once the priming is completed, the display will change back to the previous screen the pump was in before priming. If more priming is needed, repeat procedure.

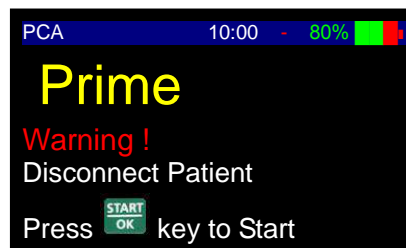❖ Make sure that all air is removed from the IV line before connecting to the patient.

Prime – In PCA Mode

1. Turn on the *VET-PRO VIP 2000™* pump, by pressing [ON OFF] until the Self-Test screen appears. If air sensor is off, press [START OK] to confirm.

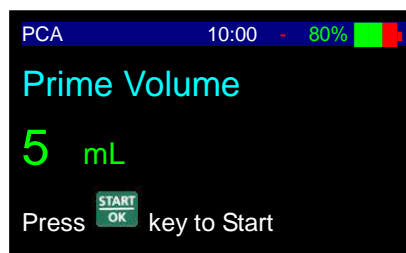2.   After entering the PCA code, the PCA menu displays, select "Prime" and press [START OK] to confirm.

> PCA   10:00 - 80%
> **Prime**
> Program Infusion
> Clinician Bolus
> Patient History
> Review Set up
> Change Set up
>
> Select [5↑], [0↓] and press [START OK]

3.   Press OK to program priming procedure.

> PCA   10:00 - 80%
>
> ## Prime
> Warning !
> Disconnect Patient
>
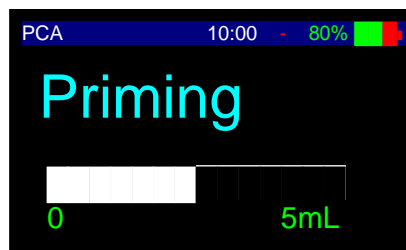> Press [START OK] key to Start

⚠ **Warning:** Ensure the set is not connected to the patient!

4.   Enter the volume to prime the set and press [START OK] to begin priming procedure. You may stop priming at any time by pressing [STOP NO].

> PCA   10:00 - 80%
> Prime Volume
>
> 5 mL
>
> Press [START OK] key to Start

5.   The display screen will show a graph indicating the prime operation.

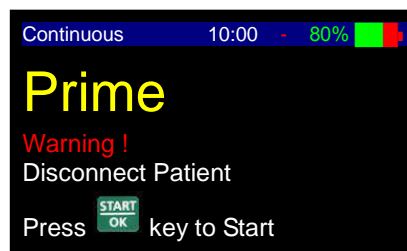> PCA   10:00 - 80%
>
> ## Priming
>
> 0   5mL

6.   Once the priming is completed, the display will change back to the previous screen the pump was in before priming. If more priming is needed, repeat procedure.

❖   Make sure that all air is removed from the IV line before connecting to the patient.
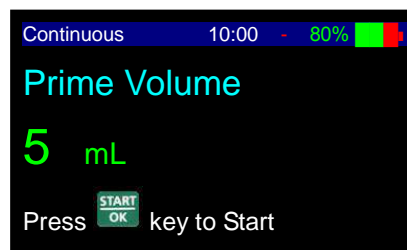
Prime Operation – After Air In Line Alarm

1.   Press [STOP NO] to mute the alarm.

2.   Disconnect IV tubing from patient.

3. Press **PRIME BOLUS** once.

> | Continuous 10:00 - 80% |
> | --- |
> | **Prime** |
> | Warning ! |
> | Disconnect Patient |
> | Press **START OK** key to Start |

⚠ **Warning:** Ensure the set is not connected to the patient!

4.
Enter the volume to prime the set and press **START OK** to begin priming procedure. You may stop priming at any time by pressing **STOP NO**.

> | Continuous 10:00 - 80% |
> | --- |
> | **Prime Volume** |
> | **5** mL |
> | Press **START OK** key to Start |

5. The display screen will show a graph indicating the prime operation.

> | Continuous 10:00 - 80% |
> | --- |
> | **Priming** |
> | 1   5mL |

6. When priming is completed make certain that all air is removed from the IV line.

7. Connect IV line to the patient and press **START OK** to resume program.

Manual Prime Operation

1. In any case (before operation or after air in line alarm) a prime operation is needed, the user can prime the set manually by using the manual priming valve, if assembled in the administration set in use at that moment.

2. Disconnect IV tubing from patient.

3. Hold the tubing in a vertical position to maintain gravitation pressure. Press the priming valve button continuously until all trapped air is primed. Release the priming valve button to continue the anti free flow protection while infusing.

Operation Steps

The following are the steps for starting the infusion procedure. For detailed instructions regarding each step, refer to the relevant sections in the Operation chapter.

Pump Mounted on IV Pole

1.   Connect the administration set to the medication bag. Hang the bag on an IV pole.

2.   Click the pump into the Charger. Mount the Charger on an IV pole.

3.   Connect the Charger via a standard power cord to a grounded AC outlet.

4.   Open the door of the pump and load the administration set into the pump's tubing channel.

5.   Turn on the *VET-PRO VIP 2000™* pump, by pressing [ON/OFF] until the Self-Test screen appears.

⚠ **Warning:** If air sensor is OFF, please contact your technician in order to enable the air sensor. Using the pump with air in line detector off may cause an embolism resulting death or paralysis. Switching the air detector off is not recommended and should be used only when absolutely necessary.

6.   The program and status will appear on the display followed by the last rate setting.

7.   Prime the administration set.

⚠ **Warning:** Make sure patient is not connected to the pump during priming!

8.   Set the required program and continue as described for every program setting.

⚠ **Warning:** Verify that infusion is proceeding normally before leaving the pump unattended.

Portable Connection

1.   Connect the administration set to the medication bag.

2.   Open the door of the pump and load the administration set into the pump's tubing guide.

3.   Turn on the *VET-PRO VIP 2000™* pump, by pressing [ON/OFF] until the Self-Test screen appears.

⚠ **Warning:** If air sensor is OFF, please contact your technician in order to enable the air sensor. Using the pump with air in line detector off may cause an embolism resulting death or paralysis. Switching the air detector off is not recommended and should be used only when absolutely necessary.

4.   Prime the administration set.

⚠ **Warning:** Make sure patient is not connected to the pump during priming!

5.   Set the required program and continue as described for every program setting.

⚠ **Warning:** Verify that infusion is proceeding normally before inserting the bag and pump into the carrying bag.

Programming

The *VET-PRO VIP 2000™* infusion system features five different programming options:

Continuous Program

- Rate: 0.1 to 100 ml/hr in 0.1 ml increments, and 100 to 1200 ml/hr in 1 ml increments
- Total Volume to be Infused: 0.1 to 9999 ml
- Program as Rate Over Volume or Volume Over Time
- Secondary Infusion (Piggy) Rate: 0.1 to 100 ml/hr in 0.1 ml increments, and 100 to 1200 ml/hr in 1 ml increments
- Secondary Infusion (Piggy) Volume: 0.1 to 9999 ml

Drug Library Program

- Continuous program
- 128 drug protocols based on patient data
- Allocation of protocols to up to 24 departments
- Utilizes hard and soft limits

Intermittent Program

- Used for setting a dose protocol at set intervals from 0.1 to 100 ml/hr in 0.1 ml increments, and 100 to 1200 ml/hr in 1 ml increments
- Volume: 0.1 to 9999 ml
- Interval Time: 0:01 minute to 20:00 hours

25 Steps Program

- Used for setting specific protocol that contains up to 25 steps
- Rate: 0.1 to 100 ml/hr in 0.1 ml increments, and 100 to 1200 ml/hr in 1 ml increments
- Volume: 0.1 to 9999 ml for each step
- Accumulated volume for all steps is up to ten liters

TPN Program

- Used for Total Parenteral Nutrition
- Volume: 1 to 9999 ml
- The program has a taper up/taper down pattern. The parameters to be set are: Total Volume, Time Up, Time Down and Total Time. The pump will calculate the ramping infusion rates.

PCA Program

- Used for PCA applications. Combines basal rate and pre-programmed bolus
- Rate: 0.0 to 100 ml/hr in 0.1 ml increments
- Volume: 0.1 to 1000 ml
- Bolus Volume: 0 to 100 ml
- Bolus Rate: 0.1 to 100 ml/hr in 0.1 ml increments, and 100 to 1200 ml/hr in 1 ml increments

Keep Vein Open Mode (KVO)

The *VET-PRO VIP 2000™* infusion system uses a Keep Vein Open (KVO) mode that can run at the end of every program, if desired. KVO also runs during a *delay before start* program and during *Interval Time* in the Intermittent program. The KVO rate can be set from 0.1 to 5 ml/hr. If the programmed infusion rate is lower than the KVO rate, the KVO will run at the programmed infusion rate. KVO during *End Program* is limited to a volume of 5 ml.

☞ NOTE: To use the automatic KVO at the end of a protocol, make sure that the IV bag contains overfill beyond the volume to be infused.

End Program

When a protocol has completed, an audible alarm will beep 4 times. To stop the alarm and enter a new program, press [STOP NO]. If the stop key is not pressed before the 4 beep have concluded, KVO will begin when it is programmed to do so.

Changing Current Program – Using Level 1 Code

1. Turn on the *VET-PRO VIP 2000™* pump, by pressing [ON OFF] until the Self-Test screen appears.

   If air sensor is OFF, please contact your technician in order to enable the air sensor. Using the Pump with air in line detector off may cause an embolism resulting death or paralysis. Switching The air detector off is not recommended and should be used only when absolutely necessary.

2. When a programming screen or infusion summary is displayed, press [info] twice.

3. Scroll to "Change Set up" option. Press [START OK].
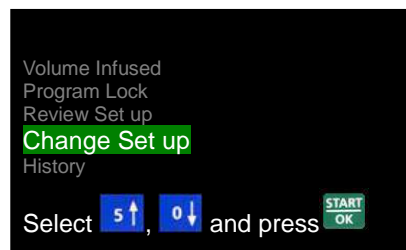
   Volume Infused
   Program Lock
   Review Set up
   Change Set up
   History

   Select [5↑], [0↓] and press [START OK]

4. Scroll to "More …" and press [START OK].

   Change Set up:

   Pressure Level
   Buzzer Level
   More …

   Select [5↑], [0↓] and press [START OK]

5. Enter *Change Set up* <u>**Level 1**</u> code, using the numeric keyboard and press [START OK].

Technician Code

Press [START OK] key
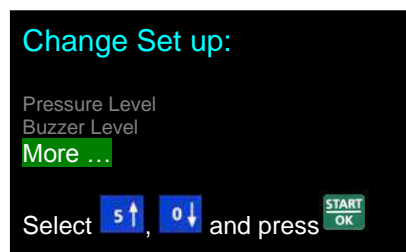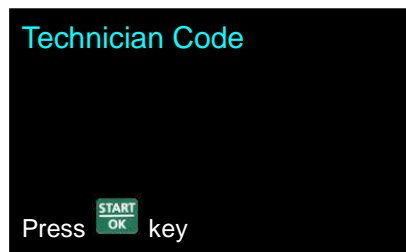
6. Scroll down to "Select Program" option and press [START OK].

Change Set up:
Pressure Default
Select Program
Priming Rate
Maximum Bolus Volume
Titration Bolus
Bolus Rate
Maximal Rate
Select [5↑], [0↓] and press [START OK]

7. Scroll to the required program and press [START OK].

Select Program:

Continuous

Select [5↑], [0↓] and press [START OK]

8. Press [START OK] to restart the pump.

Change Set up:
Time Option
WiFi module
Caregiver Delay
Language
Set Time & Date
History
Restart Pump
Select [5↑], [0↓] and press [START OK]
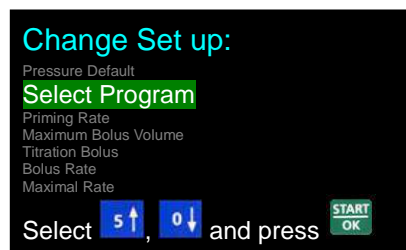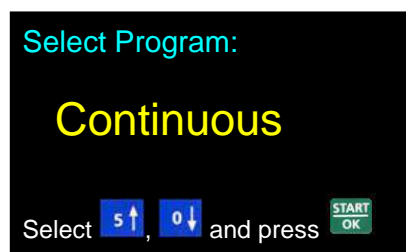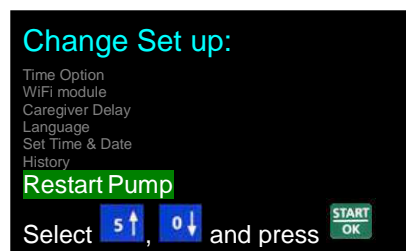
☞   NOTE: The selected program will remain in the pump's memory until changed by the operator.

Changing Current Program – Short Way

1. Turn on the *VET-PRO VIP 2000™* pump by pressing [ON OFF] until the Self-Test screen appears. If air sensor is OFF, press [START OK] to confirm.

2. Once the Self-Test is completed, immediately press and hold [STOP NO] for two seconds. The Program selection mode will be displayed.

3. Scroll to the required program and press [START OK].

Select Program:

Continuous

Select [5↑], [0↓] and press [START OK]
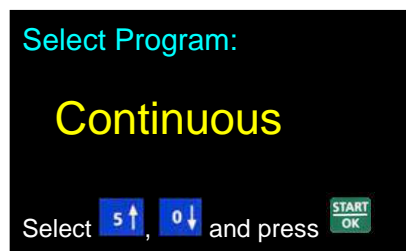
☞ NOTE: If the current selected program is **PCA or Drug Library**, the Short Way option is not available.
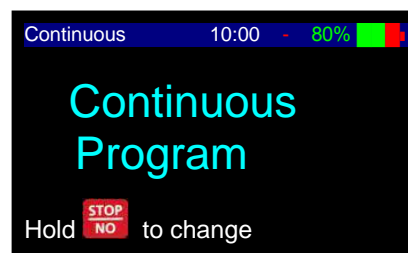
Continuous Infusion

Rate Over Volume

1. Turn the pump ON by pressing and holding the [ON OFF] until the Self-Test screen appears.
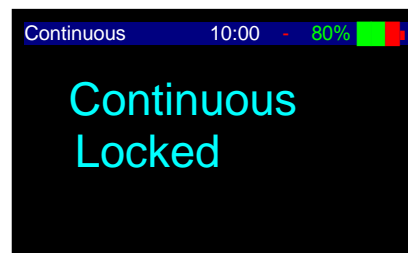
   If air sensor is OFF, please contact your technician in order to enable the air sensor if disabled. Using the pump with air in line detector off may cause an embolism resulting death or paralysis. Switching the air detector off is not recommended and should be used only when absolutely necessary.

2. Pump displays program name and status. The status is either "Program" or "Locked" (for instruction regarding locking and unlocking the pump – refer to *Lock Mode* section).

   "Program" option

Continuous	10:00	-	80%

   Continuous Program

   Hold [STOP NO] to change

   "Locked" option

Continuous	10:00	-	80%

   Continuous Locked

   When unlocked, press [START OK]. Wait for the Concentration screen to display.

☞ NOTE: When pump is in *Program mode,* all parameters can be adjusted. When pump is in *lock out mode,* parameters can be viewed, but cannot be changed.

☞ NOTE: If pump is not in *Continuous* Program, refer to changing program section for instructions.

☞ NOTE: Whenever you decide to set a new program, follow instructions at the bottom of screen.

☞ NOTE: The screen will be blank upon initial setup. When returning to a program, the screen will display the last set program.

3. ***Concentration screen***
   Default concentration is mL/hr.

   - Press [STOP NO] key to set mg/mL concentration.
   - Press 2X [STOP NO] key to set mcg/mL concentration.

   Set concentration and press [START OK] Key to move to rate screen.

Continuous	10:00	-	80%

   mL/hr

   Press [START OK] Key to Continue
   Press [STOP NO] Key for Concentration

---

4. **Rate Screen**
   Do one of the following:

   - Press [START OK] to confirm the existing parameters.
   - Enter the desired Rate and press [START OK].

> Continuous   10:00   -   80%
>
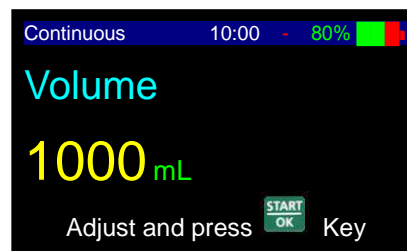> **Rate**
>
> **125** mL/hr
>
> Adjust and press [START OK] Key

☞ NOTE: Rate units can be mg/hr or mcg/hr depends on the concentration setting.

5. **Volume Screen**
   Do one of the following:

   - Press [START OK] to confirm the existing parameters.
   - Enter the desired Volume and press [START OK].

> Continuous   10:00   -   80%
>
> **Volume**
>
> **1000** mL
>
> Adjust and press [START OK] Key

6. **Accumulation Screen**
   Do one of the following:

   - Press [START OK] to confirm the existing parameters and start infusion.
   - Press [STOP NO] to go back to Concentration screen.
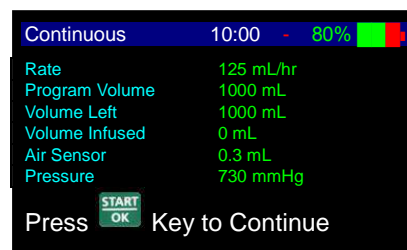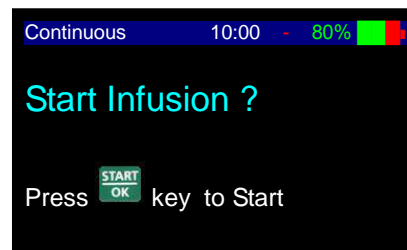
> Continuous   10:00   -   80%
>
> Rate   125 mL/hr
> Program Volume   1000 mL
> Volume Left   1000 mL
> Volume Infused   0 mL
> Air Sensor   0.3 mL
> Pressure   730 mmHg
>
> Press [START OK] Key to Continue

7. Press [START OK] to Start Infusion.

> Continuous   10:00   -   80%
>
> **Start Infusion ?**
>
> Press [START OK] key to Start

8. During program operation, the pump displays the rate in which the program is operating.

> Continuous   10:00   -   80%
>
> **Rate**
>
> **10.5** mL/hr
>
> mmHg   80   730
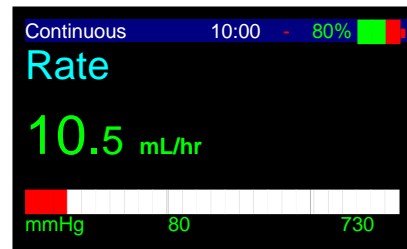
☞ NOTE: If one of the values is changed during the programming mode, the pump will not recall the new value unless changes are confirmed by pressing [START OK].

☞ NOTE: If prime procedure is activated during data setting, the pump will return to the original (previous) screen once priming is completed.

Rate Titration

The pump allows rate titration during the default *Rate Over Volume* Program.

To change the rate during the infusion:

1. Use numeric keypad to enter the new desired rate during operation and press START/OK within five seconds.
    The pump will briefly alarm and the infusion will resume at the adjusted rate.

| Continuous | 10:00 | - | 80% |
Rate

10.5 mL/hr

mmHg   80   730
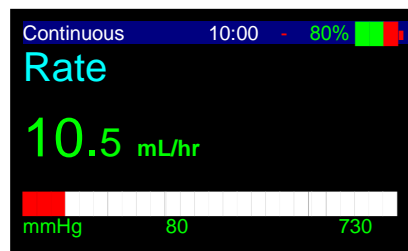
☞ NOTE: If the rate change is not confirmed within ten seconds, the pump will continue operation at the original rate and the display will return to the previous setting.

2. To stop the infusion press STOP/NO.

To change the rate while in Stop mode:

1. Press any number on the keypad twice to return to the rate screen.

2. Adjust the rate and press START/OK.

3. Adjust the volume and press START/OK three times to restart infusion.

☞ NOTE: During programming you may backspace by using STOP/NO:

Pressing STOP/NO once clears the last entered digit.

Pressing STOP/NO again clears the next number.

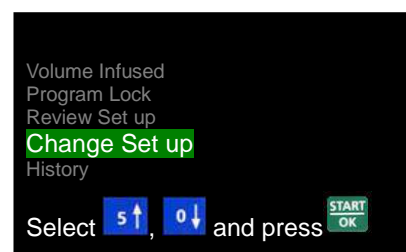Pressing STOP/NO when the value is empty displays the original value or the previous screen.

Volume Over Time

☞ NOTE: Before operating the pump in *Volume Over Time*, make sure that you are in the *Continuous* Program and that the IV bag contains an additional 5 ml of volume to be infused. This ensures adequate volume for KVO during *End Program*.

To set *Volume Over Time,* enable the time function by following the steps below:

1. Press info twice.

2. Scroll to "Change Set up" option. Press START/OK.

Volume Infused
Program Lock
Review Set up
Change Set up
History

Select 5↑, 0↓ and press START/OK

3. Scroll to "More …" and press ![START OK].

Change Set up:

Pressure Level
Buzzer Level
More …

Select ![5↑] , ![0↓] and press ![START OK]

4. Enter *Change Set up* **Level 1** code, using the numeric keyboard and press ![START OK].

Technician Code

Press ![START OK] key

5. Scroll to "Time Option" option. Press ![START OK] .

Change Set up:

Air Bubble Size
Store Last Program
Keystroke beep
Time Option
WiFi module
Caregiver Delay
Language

Select ![5↑] , ![0↓] and press ![START OK]

6. Press ![0↓] or ![5↑] , to turn Time Option ON.

7. Press ![START OK] twice.

8. **Volume Screen**
   Do one of the following:

   - Press ![START OK] to confirm the existing parameters.
   - Enter the desired volume using the numeric keypad and press ![START OK].

   | Continuous | 10:00 | - | 80% |

   Bag Volume

   30 mL

   Adjust and press ![START OK] Key

☞ NOTE: The screen will be blank upon initial setup.

9. **Infusion Time Screen**
   - Enter the desired total time using the numeric keypad (for example enter 0-2-0-0 for two hours) and press ![START OK].

   | Continuous | 10:00 | - | 80% |

   Total Time
   (HH:mm)

   02:00

   Adjust and press ![START OK] Key
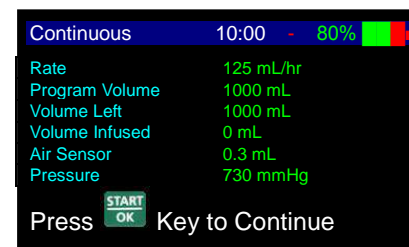
☞ NOTE: First two digits represent hours and last two digits represent minutes.

---

10. **Rate Screen**
   The pump calculates the rate based on the time and volume entered, and displays the rate on the screen. Do one of the following:

   - Press [START OK] to confirm the existing parameters.

   - Press [STOP NO] to go back to volume setting screen.

Continuous	10:00	-	80%

Rate

40 mL/hr

Adjust and press [START OK] Key

Continuous	10:00	-	80%

Rate	125 mL/hr
Program Volume	1000 mL
Volume Left	1000 mL
Volume Infused	0 mL
Air Sensor	0.3 mL
Pressure	730 mmHg

Press [START OK] Key to Continue

11. During program operation, pump displays the rate at which the program is operating.

☞ NOTE: If one of the values is changed during the programming mode, the pump will not recall the new value unless changes are confirmed by pressing [START OK].

☞ NOTE: If prime procedure is activated during data setting, the pump will return to the original (previous) screen once priming is completed.

☞ NOTE: When required to stop infusion, press [STOP NO]. Stop will be displayed on the screen. Stop mode is limited for two minutes. After two minutes, alarm will sound. Press [STOP NO] to mute or [START OK] to continue.

Resume or Repeat Infusion

Unlocked

When the pump is restarted in Continuous mode and is not locked, the pump will allow the user to confirm each of the parameters of the infusion. The V*olume* will be adjusted for the amount infused prior to turning off the pump. To reset the volume, use the numeric keypad to enter new volume.

Locked

1. When the pump is turned OFF in the middle of an infusion, this screen will appear when the pump is turned back ON.
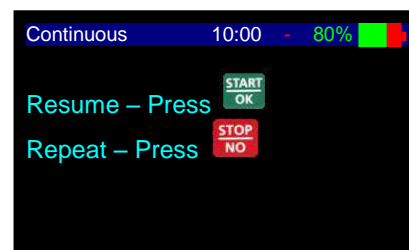
Continuous	10:00	-	80%

Resume – Press [START OK]

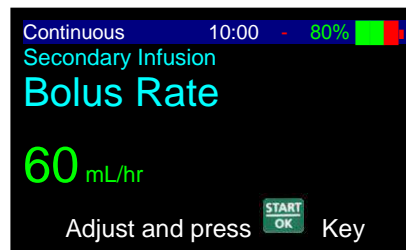Repeat – Press [STOP NO]

2. Do one of the following:

   - **Resume:** To resume this program exactly where it stopped, press [START OK]. The accumulation screen is displayed. The volume remaining will be infused.

   - **Repeat:** To restart the program at the beginning and or to set new parameters, press [STOP NO] and follow the instructions on the pump
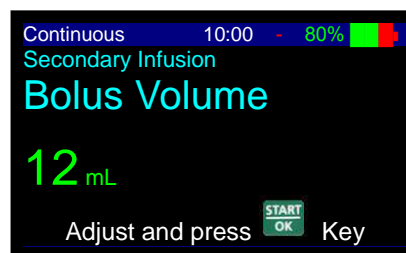
Bolus Infusion During Continuous Operation

To perform a secondary infusion during Continuous operation, complete the following steps.

1. Press **PRIME BOLUS** once.

2. Enter Secondary Infusion Rate and press **START OK** .

   Continuous   10:00   -   80%
   Secondary Infusion
   Bolus Rate

   60 mL/hr

   Adjust and press **START OK** Key

3. Enter Secondary Infusion Volume and press **START OK** .

   Continuous   10:00   -   80%
   Secondary Infusion
   Bolus Volume

   12 mL

   Adjust and press **START OK** Key

4. Pump will beep once and resume the Primary Infusion when the Secondary Infusion is completed.

☞ NOTE: User can stop the Secondary Infusion at any time by pressing **STOP NO** and turning the pump off. When the pump is turned back on, the pump will resume the Primary Infusion.

Drug Library

Drug Error Reduction System

The pump has 128 drugs referred to as protocols. Each protocol represents a drug including all of its infusion parameters. The different protocols are allocated to one department or more of the 24 available departments. Each department will be able to view ONLY the protocols allocated to that department for ease of use.

Protocols can be created using *Macro Creator™* PC software. Once the protocols have been verified by the medical personnel, they are loaded to the pump using *BodyComm™* (vr. 94 and upwards); a communication dedicated software.

Each protocol contains the following data:
- Drug name
- Departments list
- Patient weight lower & upper soft limits
- Concentration units (*mg/ml, mcg/ml, U/ml, mU/ml*)
- Concentration
- Weight & non-weight dose rate units (*mcg/kg/min, mcg/kg/hr, mg/kg/min, mg/kg/hr, mU/kg/min, mU/kg/hr, U/kg/min, U/kg/hr, mcg/min, mcg/hr, mg/min, mg/hr, mU/min, mU/hr, U/min, U/hr*)
- Dose default rate

- Dose rate lower/upper soft/hard limits.
- Bolus program (*weight,volume*)
- Bolus dose
- Bolus time units (*NOTIME, HH:MM, MM, SS*)
- Bolus time
- Bolus rate
- Bolus dose lower/upper soft/hard limits.

☞   NOTE: Each protocol parameters are unique to that protocol.

☞   NOTE: You can use protocols to set up several commonly used treatment regimes in your service i.e. same bag, drug name, basal rate but different bolus volumes or lockout times.

☞   NOTE: After setting up your most common regimes as a protocol set up the next or last protocol letter as a 'Tailored' or one off regime that you can modify for individual patients who don't fall within the pre-set protocols. Once the infusion has been administered for a particular patient you can go back in and change this for another patient.
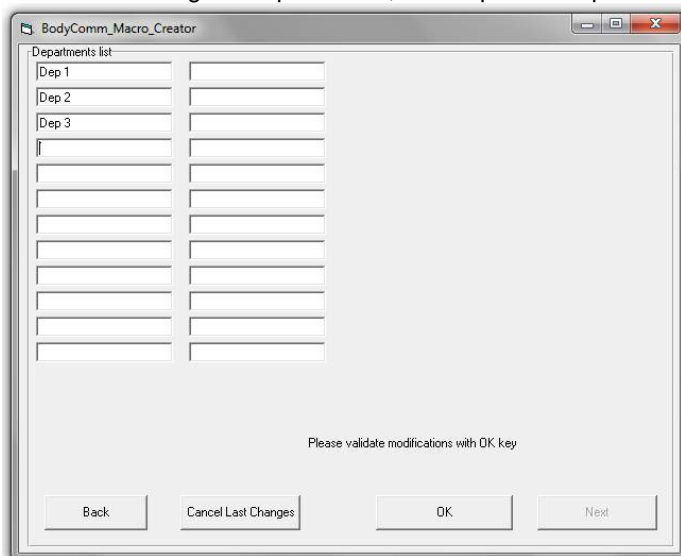

Create/Modify Protocols

Creating and/or modifying protocols can be done only by *Macro Creator*™ PC software. Below are the steps to create a full protocols drug library:

1.   Open *Macro Creator*™ PC software. On the home screen choose your pump software.

2.   Create a new drug library by clicking **new** or edit an existing drug library by selecting one from the list and clicking **open**.
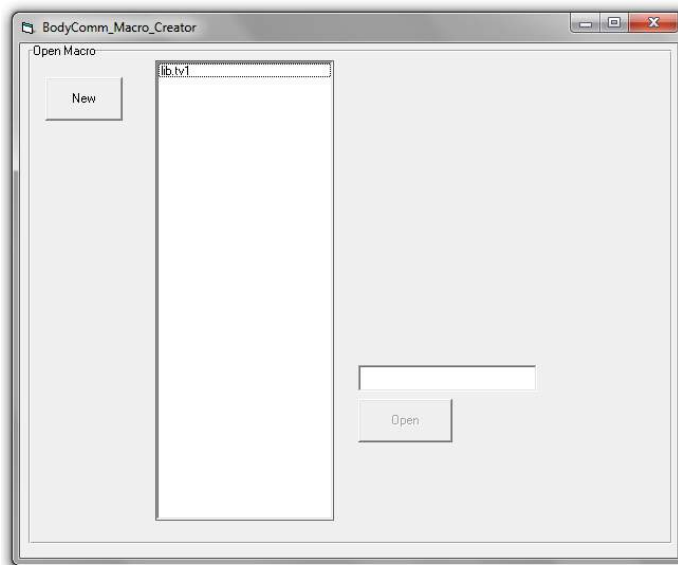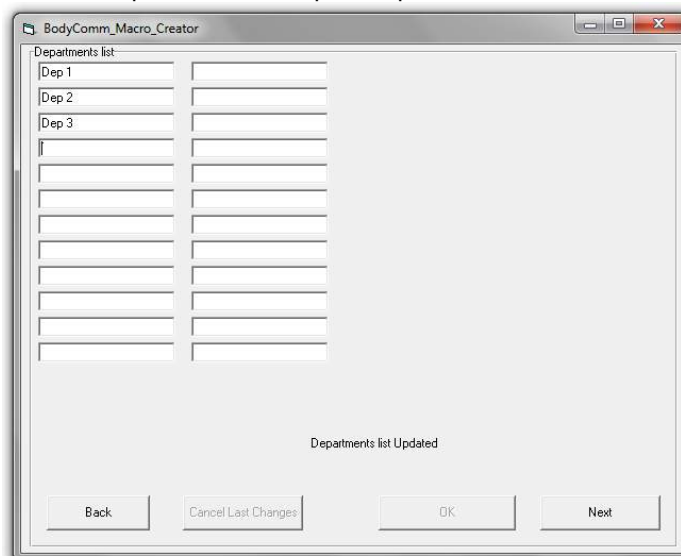
3. To associate drugs to departments, enter up to 24 departments and press **OK**.

4. After the department list is updated press **Next** to continue.

5. Add drug to the library with the following details:
   - Drug name
   - Departments list
   - Patient weight lower & upper soft limits
   - Concentration units (*mg/ml, mcg/ml, U/ml, mU/ml*)
   - Concentration
   - Dose rate unit (*mcg/kg/min, mcg/kg/hr, mg/kg/min, mg/kg/hr, mU/kg/min, mU/kg/hr, U/kg/min, U/kg/hr, mcg/min, mcg/hr, mg/min, mg/hr, mU/min, mU/hr, U/min, U/hr)*
   - Dose rate default value (initial value)
   - Dose rate lower/upper soft/hard limits
   - Bolus program (*weight, volume*)
   - Bolus default dose (initial value)
   - Bolus time units (*NOTIME, HH:MM, MM, SS)*
   - Bolus time (disabled when time units is set to *NOTIME*)
   - Bolus rate (disabled when time units is set to *HH:MM, MM, SS*)
   - Bolus dose lower/upper soft/hard limits.

   On the right you can add the drug to the relevant departments.
   To confirm and validate drug data click **OK**. In case of a data entering error or conflict, an error message will appear on the bottom part of the screen. Once you complete the drug data correctly, you can click on **Next Drug** to add another drug to library or click **Next** to continue.

6.   Add macro name and click **Save**. The created macro file is the drug library containing the different drug protocols.
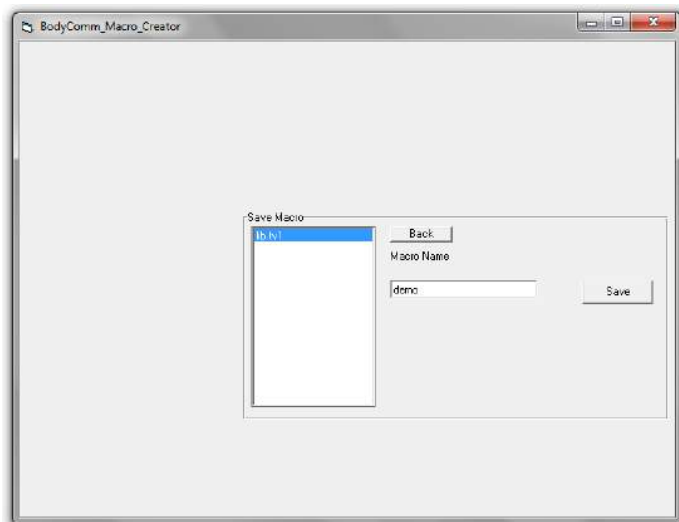
Loading Drug Library to pump

Loading the drug library is done with PC communication software, *BodyComm™* (vr. 94 and upwards). To allow pump – PC communication use a *VET-PRO VIP 2000™* pole mount charger with RS232 adaptor and RS232 cable.

1.   Plug pump to charger. Make sure pump is turned off.

2.   Connect the RS232 adaptor on the charger rear part to the RS232 cable. Connect the cable to the PC RS232 port.

3.   Open *BodyComm™* PC software. The message bellow will pop up:

4. Power up the pump and wait for the next screen (bellow) to show. Click **Protocol**.

5. Select a drug library to upload (the macro file created in the previous section) and click **Send To Pump**. When drug library is transmitted to pump a blue light will indicate the progress.
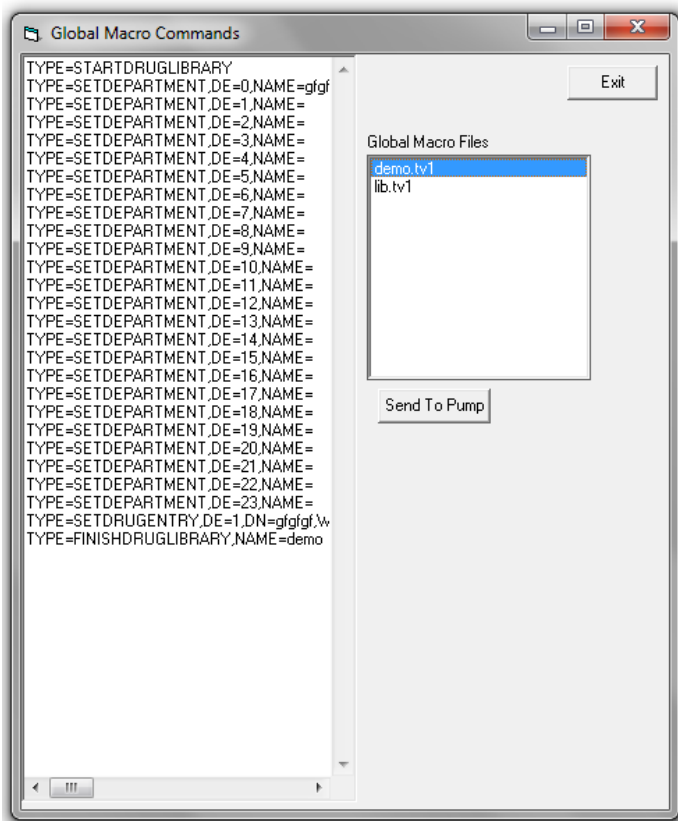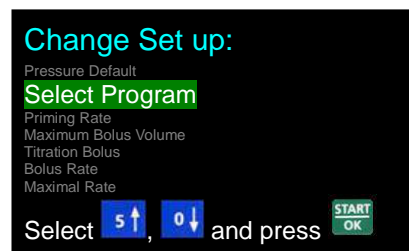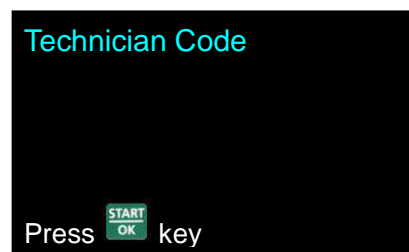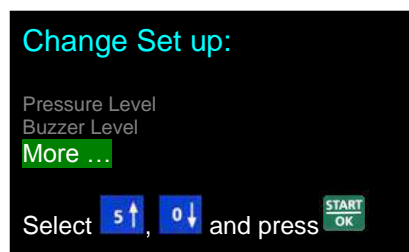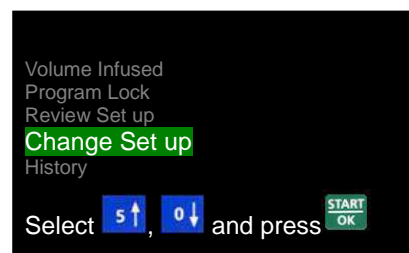

6. After transmission has ended, exit software and disconnect charger and pump.

Select Drug Departments

1. From stop mode, press info twice.

2. Scroll to "Change Set up" option. Press START OK .

Volume Infused
Program Lock
Review Set up
Change Set up
History

Select 5↑, 0↓ and press START OK

3. Scroll to "More …" and press START OK .

Change Set up:

Pressure Level
Buzzer Level
More …

Select 5↑, 0↓ and press START OK

4. Enter *Change Set up* **Level 1** code, using the numeric keyboard and press START OK .

Technician Code

Press START OK key

5. Scroll to "Select Program" option. Press START OK .

Change Set up:

Pressure Default
Select Program
Priming Rate
Maximum Bolus Volume
Titration Bolus
Bolus Rate
Maximal Rate

Select 5↑, 0↓ and press START OK

6. Scroll to "Drug Library" Program. Press START OK .

Select Program:

Drug Library

Select 5↑, 0↓ and press START OK

7. Scroll between departments, select using [5↑] & [0↓] keys. Press [START OK].

> **Department**
> **DEP1**
> DEP2
> DEP3
> DEP4
> DEP5
> DEP6
> DEP7
>
> Select [5↑], [0↓] and press [START OK]
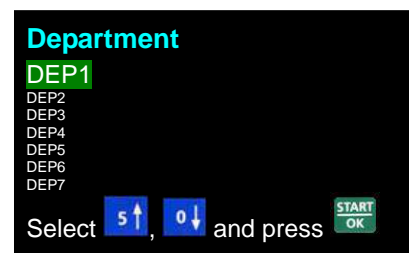
8. Press [START OK] again to restart the pump.

Drug Library Infusion

9. Turn the pump ON by pressing and holding the [ON OFF] until the Self-Test screen appears.
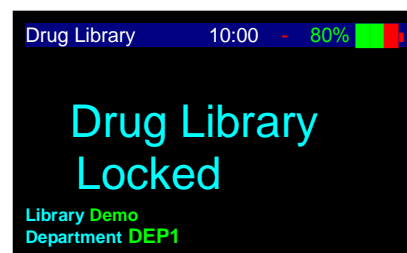
    If air sensor is OFF, please contact your technician in order to enable the disabled air sensor. Using the pump with air in line detector off may cause an air embolism resulting in death or paralysis. Switching the air detector off is not recommended and should be used only when absolutely necessary.

10. Pump displays program name and status. The status is either "Program" or "Locked" (for instruction regarding locking and unlocking the pump – refer to *Lock Mode* section).

    "Program" option

    > Drug Library   10:00   -   80%
    >
    > ## Drug Library
    > ## Program
    >
    > **Library Demo**
    > **Department DEP1**

    "Locked" option

    > Drug Library   10:00   -   80%
    >
    > ## Drug Library
    > ## Locked
    >
    > **Library Demo**
    > **Department DEP1**

    When unlocked, press [START OK]. Wait for the rate screen to display.

☞   NOTE: When pump is in *Program mode,* all parameters can be adjusted. When pump is in *lock out mode,* parameters can be viewed, but cannot be changed.

☞   NOTE: If pump is not in *Drug Library* Program, refer to Changing Program section for instructions.

☞   NOTE: Whenever you decide to set a new program, follow the instructions at the bottom of the screen.

☞   NOTE: The screen will be blank upon initial setup. When returning to a program, the screen will display the last set program.

11. **Select Drug Screen**

   • Use [0↓] or [5↑] to scroll through drugs.

   Drug Library   10:00   -   80%
   DEP1
   Select Drug:
   HEPARIN
   Concentration   40.0U/mL

   Select [5↑], [0↓] and press [START OK]

12. **Patient Weight Screen**
   Do one of the following:

   • Press [START OK] to confirm the existing parameters.

   • Enter the patient weight and press [START OK].

   Drug Library   10:00   -   80%

   Patient Weight

   100 kg

   Adjust and press [START OK] Key

13. **Dose Screen**
   Do one of the following:

   • Press [START OK] to confirm the existing parameters.

   • Enter a different dose and press [START OK].

   Drug Library   10:00   -   80%
   HEPARIN
   Dose

   50.0 mg/kg/min

   Adjust and press [START OK] Key

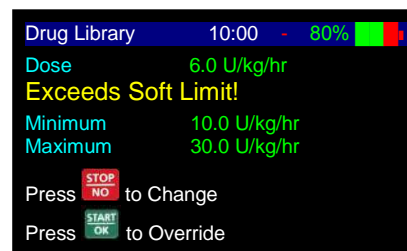☞   NOTE: dose rate units can be change only during drug protocol creation

14. **Exceeds Hard Limit Screens**
   When exceeding the lower or upper hard limit, the prgoram can not proceed. Press [STOP NO] to adjust the data.

   Drug Library   10:00   -   80%
   Dose   50.0 U/kg/hr
   Exceeds Hard Limit!

   Minimum   5.0 U/kg/hr
   Maximum   35.0 U/kg/hr

   Press [STOP NO] to Change

15. **Exceeds Soft Limit Screens**
   When exceeding the soft limits, the operator can choose to press [STOP NO] and adjust the data or press [START OK] to override and proceed.

   Drug Library   10:00   -   80%
   Dose   6.0 U/kg/hr
   Exceeds Soft Limit!
   Minimum   10.0 U/kg/hr
   Maximum   30.0 U/kg/hr

   Press [STOP NO] to Change
   Press [START OK] to Override

16. **Volume Screen**
   Do one of the following:

   • Press [START OK] to confirm the existing parameters.

   • Enter a different volume and press [START OK].

   Drug Library   10:00   -   80%

   Volume

   100 mL

   Adjust and press [START OK] Key

17. **Accumulation Screen**
    Do one of the following:

    • Press [START OK] to confirm the existing parameters and proceed.

    • Press [STOP NO] to go back to volume screen.

Drug Library	10:00	- 80%
DEP1		
Concentration	5 mg/mL	
Patient Weight	100 kg	
Dose	50.0 mg/kg/min	
Bag Volume	100 mL	
Volume Left	100 mL	
Rate	60 mL/hr	

Press [START OK] Key to Continue

18. Press [START OK] to Start Infusion.

Drug Library   10:00   - 80%

Start Infusion ?

Press [START OK] key to Start

19. During program operation, the pump displays the rate in which the program is operating.

Drug Library   10:00   - 80%
HEPARIN
Dose   50.0 mg/kg/min
Rate 60 mL/hr

mmHg   0   730

☞ NOTE: If one of the values is changed during the programming mode, the pump will not recall the new value unless changes are confirmed by pressing [START OK].

☞ NOTE: If prime procedure is activated during data setting, the pump will return to the original (previous) screen once priming is completed.

Drug Library Bolus

Bolus operation can be in two modes: weight or volume. The drug bolus mode is configured during drug protocol creation.

Bolus Weight

1. During infusion, press [PRIME BOLUS] key.

2. **Bolus Weight per Body weight Screen**
   Do one of the following:

   • Press [START OK] to confirm the existing parameters.
   • Enter a different bolus weight per body weight and press [START OK].

Drug Library   10:00   - 80%
HEPARIN
Bolus Weight
Per Body Weight

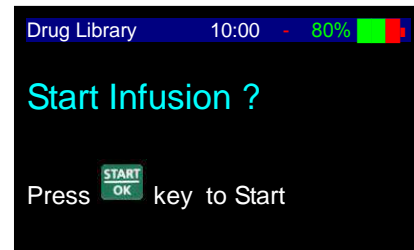20.0 U/kg

Adjust and press [START OK] Key

---

3. **Bolus Duration Screen**
   Do one of the following:

   - Press [START OK] to confirm the existing parameters.

   - Enter a different bolus duration and press [START OK].

Drug Library	10:00	-	80%

HEPARIN
Bolus duration

10:00 HH:MM

Adjust and press [START OK] Key

☞   NOTE: Bolus time units can be changed only during drug protocol creation.

4. **Bolus Accumulation Screen**
   Do one of the following:

   - Press [START OK] to confirm the existing parameters and start bolus.

   - Press [STOP NO] to go back to volume screen

Drug Library	10:00	-	80%

HEPARIN
Bolus weight   20.0 U/kg
Bolus Volume   40mL
Bolus duration   10:00:00
Bolus Rate   4mL/hr

Press [START OK] Key to Start Bolus

5. **Blousing Screen**
   The display screen will show a graph indicating the bolus is being infused. The grap bar displays the amount of the bolus to be infused (clear) and the amount infused (blue).

Drug Library	10:00	-	80%

Bolusing

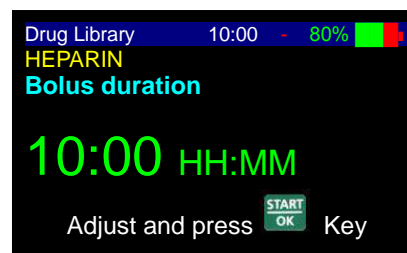1.6   40 mL

Bolus Volume

1. During infusion, press [PRIME BOLUS] key.

2. **Bolus Volume Screen**
   Do one of the following:

   - Press [START OK] to confirm the existing parameters.

   - Enter a different volume and press [START OK].

Drug Library	10:00	-	80%

HEPARIN
Bolus Volume
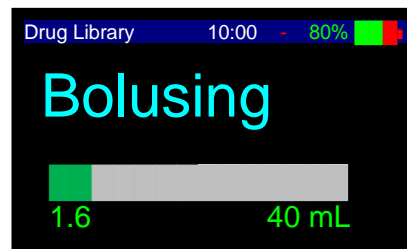
2.0 mL

Adjust and press [START OK] Key

3. **Accumulation Screen**
   Do one of the following:

   - Press [START OK] to confirm the existing parameters and start bolus.

   - Press [STOP NO] to go back to volume screen.

Drug Library	10:00	-	80%

HEPARIN

Bolus Volume   2 mL
Bolus duration   00:00:14
Bolus Rate   500mL/hr

Press [START OK] Key to Start Bolus

VET-PRO VIP 2000™ *Color Vision* Operator Manual   50

4. **Blousing Screen**
The display screen will show a graph indicating the bolus is being infused. The graphical bar displays the amount of the bolus to be infused (clear) and the amount infused (blue).
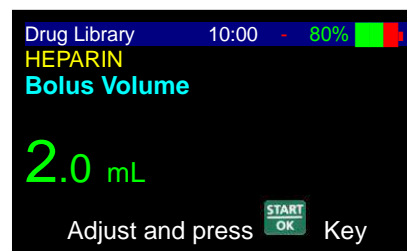
Drug Library	10:00	-	80%

Bolusing

0.2   2 mL
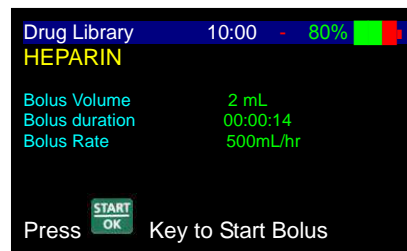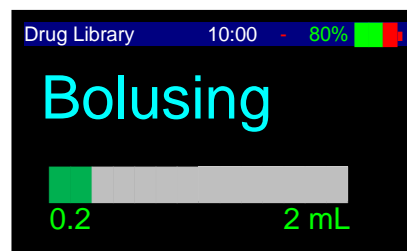
Intermittent Infusion

The Intermittent Infusion program is a special program which enables the design of a dose delivery protocol at set intervals. Each dose is given at a set time. The pump will Keep Vein Open between the doses. The infusion program continues until the total volume to be infused is delivered.

Rate Over Volume

1. Turn the pump ON by pressing and holding the [ON OFF] until the Self-Test screen appears.

   If air sensor is OFF, please contact your technician in order to enable the air sensor if disabled. Using the pump with air in line detector off may cause an embolism resulting death or paralysis. Switching the air detector off is not recommended and should be used only when absolutely necessary.

2. Pump displays program name and status. The status is either "Program" or "Locked" (for instruction regarding locking and unlocking the pump – refer to *lock* mode section).

   If pump is unocked, the Bag Volume screen will display after 2 seconds.

"Program" option

Intermittent	10:00	-	80%

Intermittent Program

Press & Hold [STOP NO] to change

"Locked" option

Intermittent	10:00	-	80%

Intermittent Locked

☞ NOTE: When pump is in *Program mode* all parameters can be adjusted; When pump is in *lock out mode,* parameters can be viewed, but cannot be changed.

☞ NOTE: If pump is not already in *Intermittent* Program, refer to Changing Program section for instructions.

☞ NOTE: Whenever you decide to set a new program, follow instructions at the bottom of screen.

☞ NOTE: When returning to a program, the screen will display the last set program.

3. **Bag Volume Screen**
   Do one of the following:

   - Press **START OK** to confirm the existing parameters.
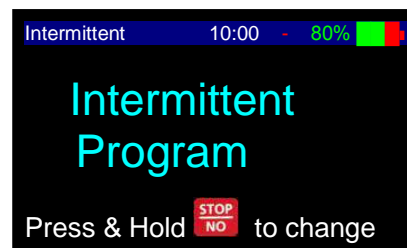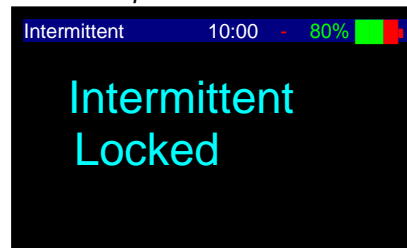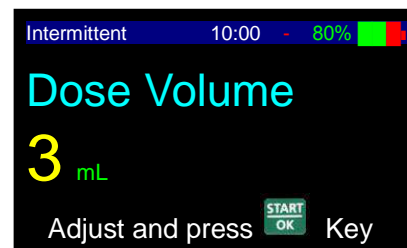
   - Enter the Bag Volume and press **START OK**.

   > Intermittent   10:00   -   80%
   >
   > ## Bag Volume
   >
   > ## 6 mL
   >
   > Adjust and press **START OK** Key

4. **Dose Volume Screen**
   Do one of the following:

   - Press **START OK** to confirm the existing parameters.

   - Enter the Dose Volume and press **START OK**.

   > Intermittent   10:00   -   80%
   >
   > ## Dose Volume
   >
   > ## 3 mL
   >
   > Adjust and press **START OK** Key

5. **Minimum Number Of Doses**
   Do one of the following:

   - Press **START OK** to confirm the existing parameters

   - Enter the minimum doses and press **START OK**.

   > Intermittent   10:00   -   80%
   >
   > Number of Doses
   > Minimum
   >
   > ## 2
   >
   > Adjust and press **START OK** Key
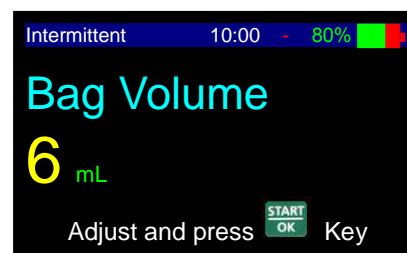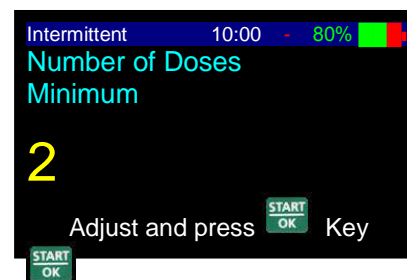
6. **Dose Rate Screen**
   Do one of the following:

   - Press **START OK** to confirm the existing parameters

   - Enter the Dose Rate and press **START OK**.

   > Intermittent   10:00   -   80%
   >
   > ## Dose Rate
   >
   > ## 50 mL/hr
   >
   > Adjust and press **START OK** Key

7. **Interval Time Screen**
   Do one of the following:

   - Press **START OK** to confirm the existing parameters
   - Enter the time between the start of each dose and press **START OK**.

   > Intermittent   10:00   -   80%
   >
   > ## Interval Time
   > (HH:mm)
   >
   > ## 00:04
   >
   > Adjust and press **START OK** Key
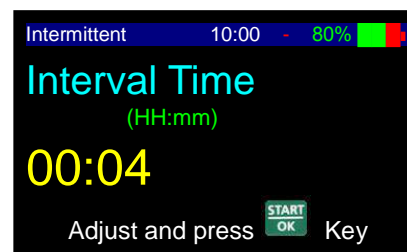
☞ NOTE: Interval time is counted from starting time of one bolus until starting time of the following bolus.

8. **KVO Rate Screen**
   Do one of the following:

   - Press **START OK** to confirm the existing parameters
   - Enter the desired KVO rate (from 0.1 to 5 ml/h) and press **START OK**.

   > Intermittent   10:00   -   80%
   >
   > ## KVO Rate
   >
   > ## 5 mL/hr
   >
   > Adjust and press **START OK** Key

9. **Accumulation Screen**
   Do one of the following:

   - Press **START OK** to confirm the existing parameters and start infusion.

   - Press **STOP NO** to go back and adjust program parameters.
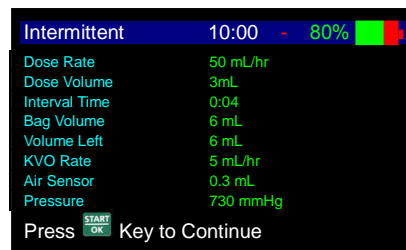
> ☞ NOTE: If pump is in **Delay Mode**, enter Start Time (24 Hour Clock) and Start Date. For further information regarding the Delay Option, refer to Delay Program section.

10. Press **START OK** to Start Infusion.
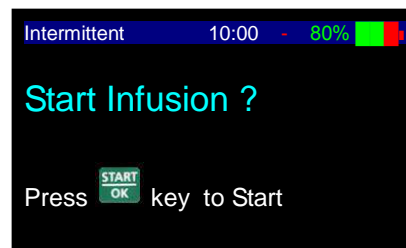
11. During program operation, the pump displays the rate

    in which the program is operating.

> ☞ NOTE: If one of the values is changed during the programming mode, the pump will not recall the new value unless changes are confirmed by pressing **START OK**.

> ☞ NOTE: If prime procedure is activated during data setting, the pump will return to the original (previous) screen once priming is completed.

> ☞ NOTE: Whenever required to stop infusion, press **STOP NO**. Stop displays on the screen. Stop mode is limited for two minutes. After two minutes an audible alarm is sounded. Press **STOP NO** again to mute the alarm.

Rate Titration

The pump allows rate titration during the *Intermittent* Program.

To change the rate during the infusion:

1. Use numeric keypad to enter the new desired rate during operation and press **START OK** within five seconds. The pump will briefly alarm and the infusion will resume at the adjusted rate.

> ☞ NOTE: If pump is LOCKED, the **Level 2** code must be entered to unlock the program and change the rate.

> ☞ NOTE: Rate titration is allowed only during dose delivery and not during KVO between doses.

☞	NOTE: If the rate change is not confirmed within ten seconds, the pump will continue operation at the original rate and the display will return to the previous setting.

2.	To stop the infusion press ![STOP NO].

☞	NOTE: During programming, you may backspace by using ![STOP NO].

Pressing ![STOP NO] once clears the last entered digit.

Pressing ![STOP NO] again clears the next number.

Pressing ![STOP NO] when the value is empty displays the original value or the previous screen.

Volume Over Time

To program using Time over Volume instead of Rate over Volume, enable the Time Option function by following the steps below:
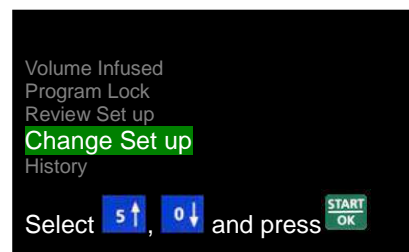
1.	Press ![info] twice.

2.	Scroll to "Change Set up" option. Press ![START OK].

> Volume Infused
> Program Lock
> Review Set up
> **Change Set up**
> History
>
> Select ![5↑], ![0↓] and press ![START OK]

3.	Scroll to "More …" and press ![START OK].

> **Change Set up:**
>
> Pressure Level
> Buzzer Level
> **More …**
>
> Select ![5↑], ![0↓] and press ![START OK]

4.	Enter *Change Set up* **Level 1** code, using the numeric keyboard and press ![START OK].

> **Technician Code**
>
> Press ![START OK] key

5. Scroll to "Time Option" option. Press [START OK].

Change Set up:

Air Bubble Size
Store Last Program
Keystroke beep
Time Option
WiFi module
Caregiver Delay
Language

Select [5↑], [0↓] and press [START OK]
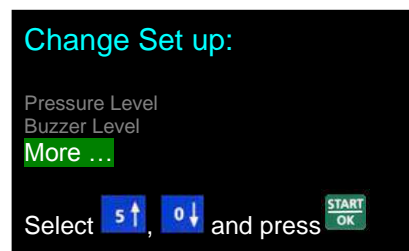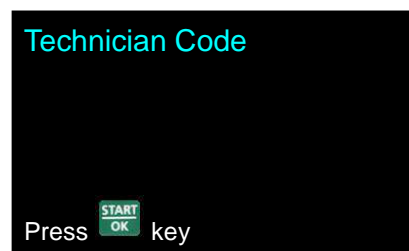
6. Press [0↓] or [5↑], to turn Time Option ON.

7. Press [START OK] twice.

8. ***Bag Volume Screen***
    Do one of the following:
    - Press [START OK] to confirm the existing parameters.
    - Enter the Bag Volume and press [START OK].

Intermittent   10:00   -   80%

Bag Volume

6 mL

Adjust and press [START OK] Key

9. ***Dose Volume Screen***
    Do one of the following:
    - Press [START OK] to confirm the existing parameters.
    - Enter the Dose Volume and press [START OK].

Intermittent   10:00   -   80%

Dose Volume

3 mL

Adjust and press [START OK] Key

10. ***Minimum Number Of Doses***
    Do one of the following:
    - Press [START OK] to confirm the existing parameters.
    - Enter the minimum doses and press [START OK].

Intermittent   10:00   -   80%

Number of Doses
Minimum

2

Adjust and press [START OK] Key
[START OK]

11. ***Dose Duration Screen***
    Do one of the following:
    - Press [START OK] to confirm the existing parameters.
    - Enter the time of a single dose and press [START OK].
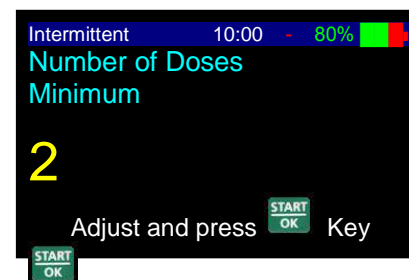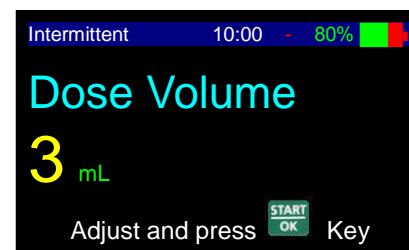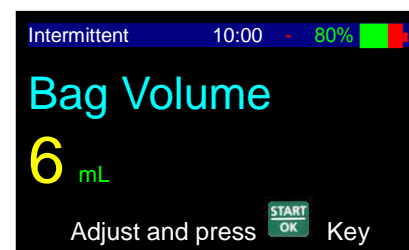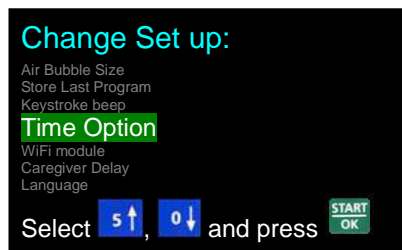
Intermittent   10:00   -   80%

Dose Duration
(HH:mm)

00:04

Adjust and press [START OK] Key

12. **Interval Time Screen**
    Do one of the following:

    - Press [START OK] to confirm the existing parameters.

    - Enter the time between the start of each dose and press [START OK].

Intermittent	10:00	-	80%

    Interval Time
    (HH:mm)

    00:04

    Adjust and press [START OK] Key

13. **KVO Rate Screen**
    Do one of the following:

    - Press [START OK] to confirm the existing parameters.

    - Enter the KVO Rate (from 0.1 to 5 ml/h) and press [START OK].

Intermittent	10:00	-	80%

    KVO Rate

    5 mL/hr

    Adjust and press [START OK] Key

14. **Accumulation Screen**
    Do one of the following:

    - Press [START OK] to confirm the existing parameters and start infusion.

    - Press [STOP NO] to go back and adjust program parameters.

Intermittent	10:00	-	80%
Dose Rate	50 mL/hr		
Dose Volume	3mL		
Interval Time	0:04		
Bag Volume	6 mL		
Volume Left	6 mL		
KVO Rate	5 mL/hr		
Air Sensor	0.3 mL		
Pressure	730 mmHg		

    Press [START OK] Key to Continue
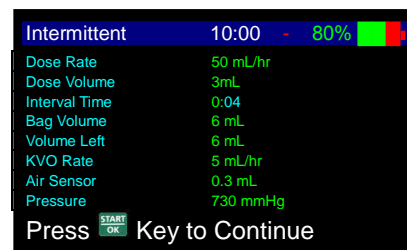
☞ NOTE: If pump is in **Delay Mode**, enter Start Time (24 Hour Clock) and Start Date. For further information regarding the Delay Option, refer to Delay Program section.

15. Press [START OK] to Start Infusion.

Intermittent	10:00	-	80%

    Start Infusion ?

    Press [START OK] key to Start
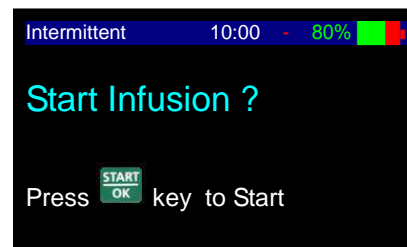
16. During program operation, the pump displays the rate in which the program is operating.

Resume Infusion, Start New Bag, or Restart Infusion

When an Intermittent infusion is unlocked , stopped and the pump is re-started, the user has the following options:

(1) **Resume:** Resume the original infusion exactly where it left off
(2) **New Bag:** Resume the original infusion with a new bag
(3) **Repeat:** Repeat or re-program the infusion

1. **Intermittent Restart Screen**

   Press [0↓] or [5↑] to scroll to the appropriate selection and press [START OK].

Intermittent	10:00	-	80%

   Resume
   New Bag
   Repeat

   Select [5↑], [0↓] and press [START OK]

☞ NOTE: If pump is Locked, the user will only have the "Resume" and "New Bag" options available.

2. **Resume – New Bag – Restart Screen**
   Display shows a summary of the current infusion to be started. Press [START OK] to start infusion.

Intermittent	10:00	-	80%

Dose Rate	50 mL/hr
Dose Volume	3mL
Interval Time	0:04
Bag Volume	6 mL
Volume Left	6 mL
KVO Rate	5 mL/hr
Air Sensor	0.3 mL
Pressure	730 mmHg

   Press [START OK] Key to Continue
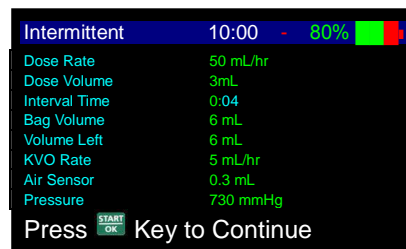
Program Delay

Turning the Delay Option ON

1. Press [info] twice from STOP or setting mode.

   ⚠ Warning: If air sensor is off, please contact your technician in order to enable the air sensor if disabled. Using the pump with air in line detector off may cause an embolism resulting death or paralysis. Switching the air detector off is not recommended and should be used only when absolutely necessary.

2. Scroll to "Change Set up" option and press [START OK].
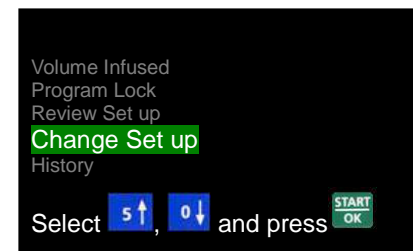
   Volume Infused
   Program Lock
   Review Set up
   Change Set up
   History

   Select [5↑], [0↓] and press [START OK]

3. Scroll to "More …" and press [START OK].

   Change Set up:

   Pressure Level
   Buzzer Level
   More …

   Select [5↑], [0↓] and press [START OK]

4.   Enter *Change Set up* level 1 code, using the numeric keyboard and press **START OK**.

Technician Code

Press **START OK** key

5.   Scroll to *"Caregiver Delay"* option and press **START OK**.

Change Set up:
Keystroke beep
Time Option
WiFi module
Caregiver Delay
Language
Set Time & Date
History
Select **5↑**, **0↓** and press **START OK**

6.   Turn delay option ON by pressing **0↓** or **5↑**.

7.   Press **START OK** and the screen displays Restart Pump

8.   Press **START OK** to continue.

Setting Delay Before Start

After entering the program data, the pump enables delay setting (when *Delay Before Start* is turned ON).

☞   NOTE: The delay time is set according to a 24 hour clock. This means that hours are viewed as follows 10:00, 11:00, 12:00, 13:00, 14:00, 15:00 etc.

☞   NOTE: The pump automatically displays the current time and date. To start pump immediately, press **START OK** to confirm the existing time and date and start infusion.

☞   NOTE: If the time and/or date automatically displayed by the pump are not correct, go to the *Settings Menu* and select *"Set Time & Date"* to reset the clock in the pump.

1.   **Start Time Screen**
To change the Start Time, type the desired start time using the numeric keypad and press **START OK**. To start pump immediately, do not change the time and press **START OK**.

Intermittent   10:00   -   80%
01-Jan-2000 10:00
Caregiver Delay
Start Time
        (HH : mm)
        22:00
Adjust and press **START OK** Key

☞   NOTE: To start pump at **9:30 AM**, enter **0-9-3-0**. To start the pump at **9:30 PM**, enter **2-1-3-0**.

2. ***Start Date Screen***
   To change the Start Date, type the desired start date
   using the numeric keypad and press [START OK]. To start
   pump on the same day, do not change the date and press
   [START OK] .

   > Intermittent   10:00   -   80%
   > 01-Jan-2000 10:00
   > Caregiver Delay
   > Start Date
   >   (DD-MM-YYYY)
   > **01-Jan-2000**
   >
   > Adjust and press [START OK] Key

3. ***KVO During Delay Screen***
   During delay time, pump will operate in KVO mode. Time
   left will count down until 00:00 and will then automatically
   start the progrmamed infusion. During the delay, this
   screen will be displayed showing when the infusion will
   start.

   > Intermittent   10:00   -   80%
   > Caregiver Delay
   > Rate
   > 2.5 mL/hr
   > 01-Jan-2000 22:00
   > Start Time   22:02
   > Start Date   01-Jan-2000

☞ NOTE: After delay time, pump will beep once and infusion will start automatically.

☞ NOTE: KVO rate is configured in 'change set-up' menu.

Turning Pump Off in the Middle of an Intermittent Infusion

When the pump is turned OFF during an intermittent infusion, the internal clock in the pump will continue to monitor the timing of the infusion.

If the pump is stopped during a dose, the user will be able to resume the dose if the infusion is resumed before one third of the interval time has elapsed. For example, if the interval is 4 hours, then the user can restart the infusion within 1 hour and 20 minutes of the interval time to receive the remainder of the dose. In this case, the pump will still resume the following dose at the scheduled time. If the user restarts the infusion after one third of the interval time has elapsed, then the user will not be receive the remainder of the dose. The pump will resume in the middle of the interval and receive KVO until the next dose is due. The purpose of this "One Third" rule is to allow the user to turn their pump off during a dose without changing the scheduled dose times.

If the pump is turned off during a dose and not restarted until after the next scheduled dose was scheduled, then the pump will start the next dose immediately followed by a complete interval. For example, if the patient restarts the infusion an hour past the scheduled dose time, then will receive a complete dose followed by a complete interval.

If the pump is turned off during the interval period, the patient can restart the pump anytime before the next scheduled dose without impacting the timing of the delivery of the next dose. If the pump is not restarted until after the next scheduled does was scheduled, then the pump will start the next dose immediately followed by a complete interval.

25 Steps Program

This program permits programming of up to twenty-five different steps. Each step has its own rate and volume. Step accumulation is limited to a Volume of ten (10) liters. Protocol steps are delivered sequentially until all steps are completed.

☞ NOTE: Before operating the pump in *25 Steps Program*, make sure that the IV bag contains an additional 5 ml of total volume to be infused. This ensures adequate volume for KVO during *End Program*. If *Delay Before Start* is set, you must include enough volume for the delay period, in addition to the 5 ml KVO volume.

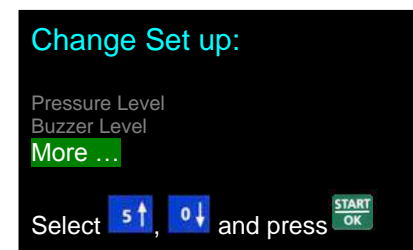1. Turn the pump on by pressing and holding the [ON/OFF] until the Self-Test screen appears.

⚠ **Warning:** If air sensor is OFF, please contact your technician in order to enable the air sensor if disabled. Using the pump with air in line detector off may cause an embolism resulting death or paralysis. Switching the air detector off is not recommended and should be used only when absolutely necessary.

2. Pump displays program name and status. The status is either "Lock out" or "program" (for instruction regarding locking and unlocking the pump, refer to *locking* section).

   When the pump is unlocked, press [START/OK] to continue.
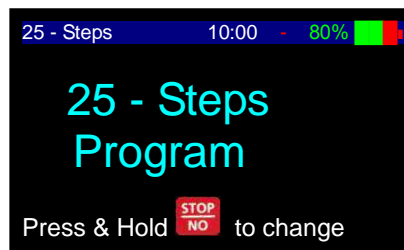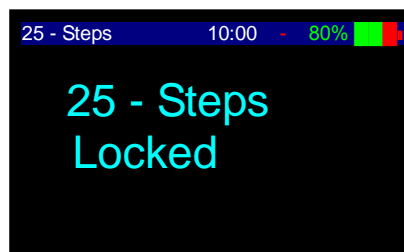
   "Program" option

25 - Steps	10:00	-	80%

   25 - Steps
   Program

   Press & Hold [STOP/NO] to change

   "Lock out" option

25 - Steps	10:00	-	80%

   25 - Steps
   Locked

☞ NOTE: When pump is in *Program mode*, all parameters can be adjusted; When pump is in *lock out mode*, parameters can be viewed, but cannot be changed.

☞ NOTE: If pump is not already in *25 Steps Protocol*, refer to changing program section for instructions.

☞ NOTE: Whenever you decide to set a new program, follow instructions at the bottom of screen.

☞ NOTE: The screen will be blank upon initial setup.

3. *Rate Screen – Step 1*
   Do one of the following:

   - Press [START/OK] to confirm the existing parameters.

   - Enter the desired rate and press [START/OK].

25 - Steps	10:00	-	80%

   Rate
   Step 1
   35 mL/hr

   Adjust and press [START/OK] Key

4. *Volume Screen – Step 1*
   Do one of the following:

   - Press [START/OK] to confirm the existing parameters.

   - Enter the desired volume and press [START/OK].

25 - Steps	10:00	-	80%

   Step 1 Volume

   1234 mL

   Adjust and press [START/OK] Key
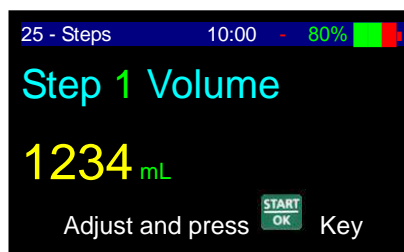
5. **Rate Screen – Step 2**
Pump displays the rate for step 2. Repeat directions as for step 1 and repeat until the required number of steps have been entered.

```
25 - Steps          10:00   -   80%

Rate
Step 2

35 mL/hr
                         START
Adjust and press   OK     Key
```

6.
After entering the last required step, press [START OK] without entering a rate.

This indicates that all data required for the protocol has been set. All programs following the last set program will be automatically cleared.

```
25 - Steps          10:00   -   80%

Rate
Step 20

    mL/hr
                         START
Adjust and press   OK     Key
```

☞ NOTE: If pump is in **Delay Mode**, enter KVO rate.

7. **Accumulation Screen**
Do one of the following:

- Press [START OK] to confirm the existing parameters.

- Press [STOP NO] to go back to rate setting screen.
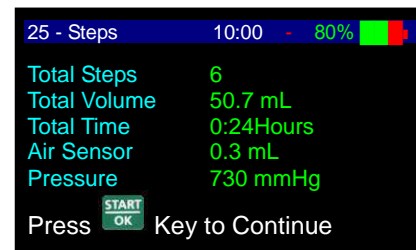
```
25 - Steps          10:00   -   80%

Total Steps      6
Total Volume     50.7 mL
Total Time       0:24Hours
Air Sensor       0.3 mL
Pressure         730 mmHg
       START
Press  OK    Key to Continue
```

☞ NOTE: If pump is in **Delay Mode**, enter Start Time (24 Hour Clock) and Start Date. For further information regarding the Delay Option, refer to Delay Program section.

8.
Press [START OK] to Start Infusion.

```
25 - Steps          10:00   -   80%


Start Infusion ?

       START
Press  OK    key  to Start
```
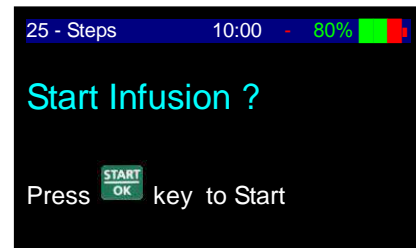
9. During program operation, the display identifies which step is currently running, and the rate.

☞ NOTE: If one of the values is changed during the programming mode, the pump will not recall the new value unless changes are confirmed by pressing [START OK].

If prime procedure is activated during data setting, the pump will return to the original (previous) screen once priming is completed.

☞ NOTE: Whenever required to stop infusion, press [STOP NO]. Stop displays on the screen. Stop mode is limited for two minutes. After two minutes an audible alarm is sounded. Press [STOP NO] again to mute the alarm.

☞   NOTE: During programming you may backspace by using![STOP NO] .

Pressing ![STOP NO] once clears the last entered digit.

Pressing ![STOP NO] again clears the next number.

Pressing ![STOP NO] when the value is empty displays the original value or the previous screen.

TPN Infusion

Total **P**arenteral **N**utrition - This mode delivers an infusion while automatically tapering up and down. The pattern of the program is a trapezoid.

TPN Trapezoid Program

T1 = Time UP
T2= Time FLAT
T3= Time DOWN
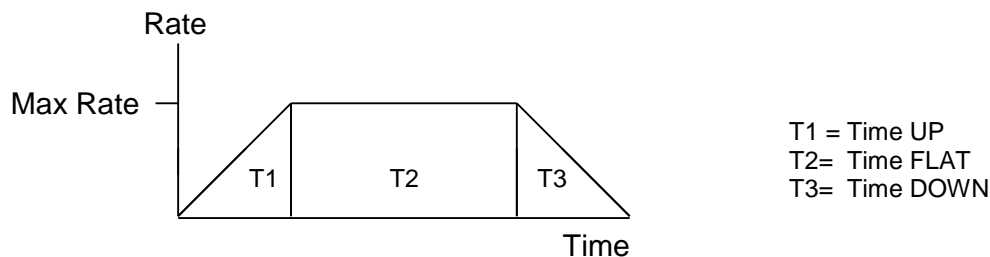
On a TPN Program the operator may set the total volume which corresponds to the size of the bag to be infused, the total time, and the up and down time. Program operation will start from 2 ml/h and will increase to the maximal rate. During the flat session (T2) the rate will not change. During the last part of the program (T3), the program will start to decrease the infusion rate according to the set taper down time.

Up and down time can be set to zero. A TPN program with up and down time set to zero, is a **continuous** program.

☞   NOTE: Before operating the pump in *TPN program*, make sure that the IV bag contains an additional 5 ml of total volume to be infused. This ensures adequate volume for KVO during *End Program*. If *Delay Before Start* is set, you must include enough volume for the delay period in addition to the 5 ml KVO volume.

1.   Turn the pump on by pressing and holding the ![ON OFF] until the Self-Test screen appears.

⚠ **Warning:** If air sensor is off, please contact your technician in order to enable the air sensor if disabled. Using the pump with air in line detector off may cause an embolism resulting death or paralysis. Switching the air detector off is not recommended and should be used only when absolutely necessary.

2. Pump displays program name and status. The status is either "Lock Out" or "Program" (for instruction regarding locking and unlocking the pump – refer to *Lock Out* section).

    When pump unlocked, press [START OK] to continue.
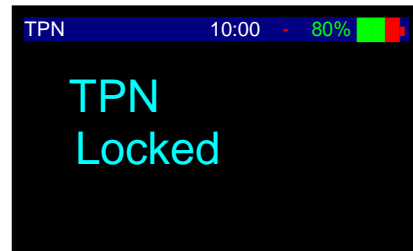
"Program" option

TPN	10:00	-	80%

TPN
Program

Press & Hold [STOP NO] to change

"Lock Out" option

TPN	10:00	-	80%

TPN
Locked

☞ NOTE: When pump is in *Program mode*, all parameters can be adjusted; When pump is in *lock out mode* parameters can be viewed, but cannot be changed.

☞ NOTE: If pump is not already in *TPN* Program, refer to changing program section for instructions.

☞ NOTE: Whenever you decide to set a new program, follow instructions at the bottom of screen.

3. **Bag Volume Screen**
    Do one of the following:

    • Press [START OK] to confirm the existing parameters.

    • Enter the desired volume and press [START OK].

TPN	10:00	-	80%

Bag Volume

1000 mL

Adjust and press [START OK] Key

4. **Volume To Be Infused (TBI) Screen**
    Do one of the following:

    • Press [START OK] to confirm the existing parameters.

    • Enter the desired volume and press [START OK].

TPN	10:00	-	80%

Volume VTBI

950 mL

Adjust and press [START OK] Key
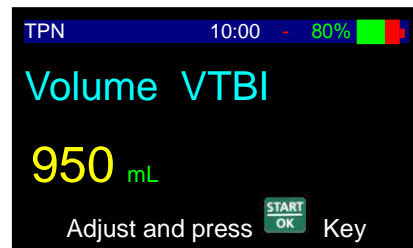
5. **Total Time Screen**
    The screen displays the last set time (total time for the program to run). Press [START OK] to confirm the existing parameters or enter the desired time and press [START OK].

TPN	10:00	-	80%

Total Time
(HH:mm)

10:00

Adjust and press [START OK] Key

☞ NOTE: First two digits represent hours and last two digits represent minutes (for example, enter 0-2-0-0 for 2 hours.). Use a point to move from hours to minutes.

6. **Up Time Screen**
The screen displays the time for rate to taper up. Press **START OK** to confirm the existing parameters or enter the desired value (from 00:00 to 04:15 hours). Press **START OK**.

TPN	10:00 - 80%
Up Time	
(HH:mm)	
1:23	
Adjust and press **START OK** Key	

7. **Down Time Screen**
The screen displays the time for rate to taper down. Press **START OK** to confirm the existing parameters or enter the desired value (from 00:00 to 04:15 hours). Press **START OK**.

TPN	10:00 - 80%
Down Time	
(HH:mm)	
1:23	
Adjust and press **START OK** Key	

8. **KVO Rate Screen**
Do one of the following:

- Press **START OK** to confirm the existing parameters

- Enter the desired Interval Time and press **START OK**.

TPN	10:00 - 80%
KVO Rate	
2.5 mL/hr	
Adjust and press **START OK** Key	
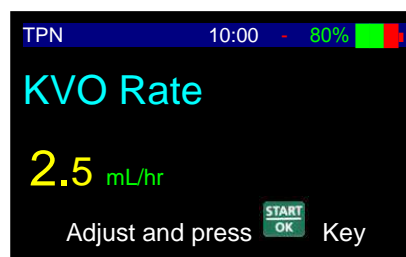
9. **Accumulation Screen**
The pump calculates the set data and displays the accumulation screen with the maximal rate for the program (to be infused during flat period).
Do one of the following:

- Press **START OK** to confirm parameters and start infusion or enter delay time, if applicable. For further information regarding delay option, refer to delay program section.

- Press **STOP NO** to go back to volume setting screen.
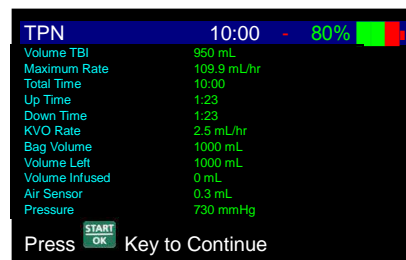
TPN	10:00 - 80%
Volume TBI	950 mL
Maximum Rate	109.9 mL/hr
Total Time	10:00
Up Time	1:23
Down Time	1:23
KVO Rate	2.5 mL/hr
Bag Volume	1000 mL
Volume Left	1000 mL
Volume Infused	0 mL
Air Sensor	0.3 mL
Pressure	730 mmHg
Press **START OK** Key to Continue	

10. Press **START OK** to start infusion.

TPN	10:00 - 80%
Start Infusion ?	
Press **START OK** key to Start	
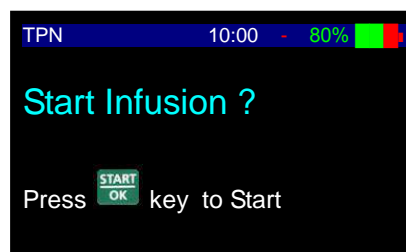
11. During program operation, pump displays the rate in which the program is operating and program direction (Up/Flat/Down).

Early Taper Down

If the program must be interrupted early and the planned taper down time must commence immediately, do as follows:

1. Press **STOP NO** continually (2 seconds) to stop the pump operation and display Taper Down screen.

TPN	10:00	-	80%
Early Taper Down			
Down Time			
(HH:mm)			
1:23			
Adjust and press **START OK** Key			

2. Do one of the following:

   • Press **START OK** to start the taper down process immediately with the existing parameters.

   • Enter time for taper down, using the numeric keys, and press **START OK** to start the taper down process. Taper down time should be lower than the ongoing taper down time.

☞ NOTE: If one of the values is changed during the programming mode, the pump will not recall the new value unless changes are confirmed by pressing **START OK**.

☞ NOTE: If prime procedure is activated during data setting, the pump will return to the original (previous) screen once priming is completed.

☞ NOTE: Whenever required to stop infusion, press **STOP NO**. Stop displays on the screen. Stop mode is limited for two minutes. After two minutes, an audible alarm is sounded. Press **STOP NO** again to mute the alarm.

☞ NOTE: During programming you may backspace by using **STOP NO**.

   Pressing **STOP NO** once clears the last entered digit.

   Pressing **STOP NO** again clears the next number.

   Pressing **STOP NO** when the value is empty displays the original value or the previous screen.

Resume or Repeat Infusion

1. When the pump is turned OFF during infusion, this screen will appear when the pump is turned back ON.

TPN	10:00	-	80%
Resume – Press **START OK**			
Repeat – Press **STOP NO**			

2. Do one of the following:

- **Resume:** To resume this program exactly where it stopped, press [START OK]. The accumulation screen is displayed. The volume remaining will be infused.

- **Repeat:** To restart the program at the beginning and or to set new parameters, press [STOP NO] and follow the instructions on the pump

PCA Infusion

Patient Control Analgesia is a program used for patients who require IV pain management or epidural analgesia. Pain management is undertaken by delivering a continuous basal rate, in combination with pre-programmed boluses. The pump will deliver only the boluses corresponding to the preset time intervals. All attempts to obtain a bolus are stored in the pump memory. The physician can read these statistics and adjust the settings as required.

⚠ **Warning:** When operating the pump on PCA program with a rate of 0.0 ml/h there is a hazard of blood clot forming. Connect saline infusion in parallel to avoid this problem.

PCA Menu

Due to the sensitive nature of PCA infusions, the *VET-PRO VIP 2000™* has a specific menu to enhance the user experience while programming PCA infusions. The menu organizes the infusion information centrally while maintaining the same programming format as the other infusion modes on the pump.

1. Turn the pump on by pressing the [ON OFF] until the Self-Test screen appears.

⚠ **Warning:** If air sensor is OFF, please contact your technician in order to enable the air sensor. Using the pump with air in line detector off may cause an embolism resulting death or paralysis. Switching the air detector off is not recommended and should be used only when absolutely necessary.

2. Pump displays program name and status. The status is either "PROGRAM" or "LOCKED" (for instruction regarding locking and unlocking the pump – refer to *Unlocking PCA* section).

   Press [START OK]. If the pump is unlocked, the PCA Menu will display. If the pump is locked, the PCA Restart Menu will display (See Restart Infusion section if pump is locked)

"Program" option

PCA	10:00	-	80%

PCA
Program

"Locked" option

PCA	10:00	-	80%

PCA
Locked
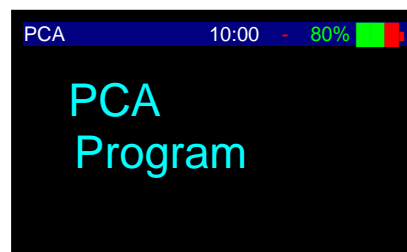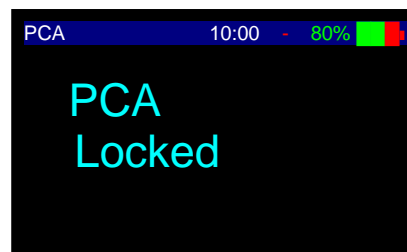
☞ NOTE: The PCA program automatically locks upon completion of programming.

NOTE: If pump is not already in *PCA* Program refer to Changing Program section for instructions.

NOTE: Whenever you decide to set a new program, follow instructions at the bottom of screen.

3. **PCA Menu Screen**

The user interface in PCA centers around the PCA menu. From the PCA menu, the user can select:

i. **Prime** – Prime Administration Set

ii. **Program Infusion** – Enter infusion details

iii. **Clinician Bolus** – Infuse extra bolus

iv. **Patient History** – View infusion history of patient

v. **Review Set up** – View pump settings

vi. **Change Set up** – Enables user to change pump settings and switch to other infusion modes.

Use [0↓] or [5↑] to scroll through options. Select the required option by pressing [START OK].

PCA	10:00	-	80%
Prime
Program Infusion
Clinician Bolus
Patient History
Review Set up
Change Set up

Select [5↑], [0↓] and press [START OK]

Priming

NOTE: Priming is disabled during PCA operation. Always prime the set before starting a program.

Warning: Always disconnect IV tubing from patient before starting priming procedure.

1. Selecting the **Prime** option from the PCA menu, the screen will show the priming screen.

| PCA | 10:00 | - | 80% |

Prime

Warning !
Disconnect Patient

Press [START OK] key to Start
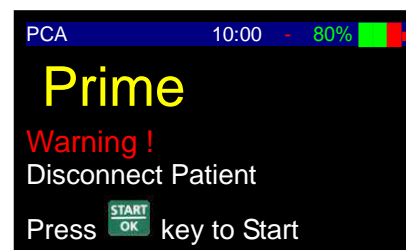
2. Press OK to program priming procedure.

Warning: Ensure the set is not connected to the patient!

3. Enter the volume to prime the set and press [START OK] to begin priming procedure. You may stop priming at any time by pressing [START OK].

| PCA | 10:00 | - | 80% |

Prime Volume

5 mL

Press [START OK] key to Start

4.	The display screen will show a graph indicating the prime operation.

```
PCA                10:00   -   80% ▇▇

Priming

┌──────────┬───────────────┐
│██████████│               │
└──────────┴───────────────┘
0                        5mL
```

5.	Once the priming is completed, the display will change back to the previous screen the pump was in before priming. If more priming is needed, repeat procedure.

Program Infusion

1.	*PCA Menu Screen*

	Select **Program Infusion** and press [START OK].

```
PCA                10:00   -   80% ▇▇
Prime
Program Infusion
Clinician Bolus
Patient History
Review Set up
Change Set up

Select [5↑], [0↓] and press [START OK]
```
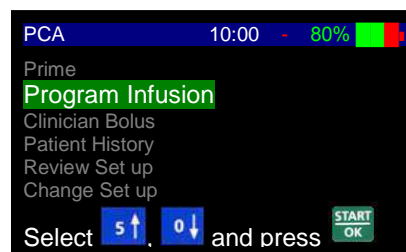
2.	*New Patient Screen*
	If programming a protocol for a new patient, select *New Patient* by pressing [START OK]. If the protocol is not for a new patient, press [STOP NO] Pressing [STOP NO] will clear the volume that has been infused to the current patient.

```
PCA                10:00   -   80% ▇▇

New Patient?

Press [START OK] or [STOP NO]
```
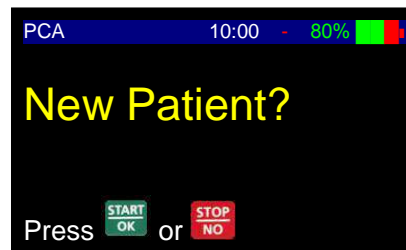
3.	*Rate/Concentration Selection Screen*
	•	To program *Rate* in Milliliters per Hour (**ml/hr**), press [START OK].
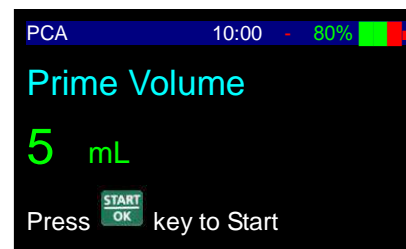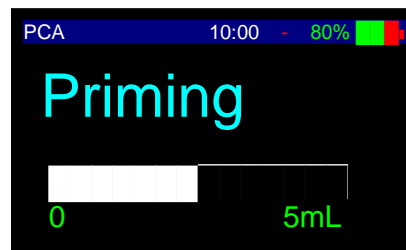	•	To program *Concentration in* Milligrams per Milliliter (**mg/ml**), press [STOP NO] once.
	•	To program *Concentration* in Micrograms per Milliliter (**mμ/ml**), press [STOP NO] twice.
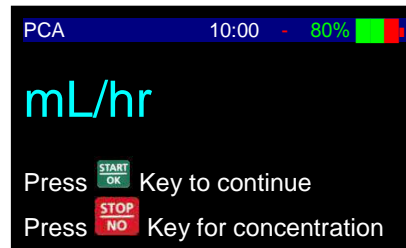
```
PCA                10:00   -   80% ▇▇

mL/hr

Press [START OK] Key to continue
Press [STOP NO] Key for concentration
```

4. ***Rate or Concentration Screen***
Do one of the following:

- Press [START OK] to confirm the existing parameters.

- Enter the desired rate or concentration and press [START OK].

Rate (ml/hr)

PCA   10:00 - 80%

Basal Rate

5 mL/hr

Adjust and press [START OK] Key

Concentration (mg/ml)

PCA   10:00 - 80%

Concentration

2 mg/ml

Adjust and press [START OK] Key

Concentration (mcg/ml)

PCA   10:00 - 80%

Concentration

1500 mcg/ml

Adjust and press [START OK] Key
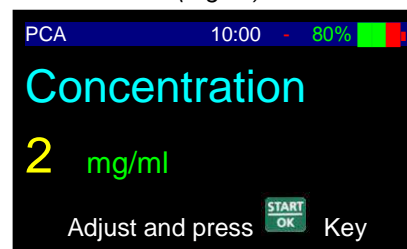
☞ NOTE: To change from *Concentration* back to *Rate*, enter 0 (zero) for Concentration and press [START OK].

5. ***Concentration Rate Screen***
(Only When Programming by Concentration)
Do one of the following:

- Press [START OK] to confirm the existing parameters.

- Enter the desired rate or concentration and press [START OK].

PCA   10:00 - 80%

Basal Rate

1000 mcg/hr

Adjust and press [START OK] Key

6. ***Rate Titration Limit Screen***
Enter the maximum rate of titration that can be used in the current protocol and press [START OK]. Rate can be ml/hr, mg/hr or mcg/hr depending on program selected.

PCA   10:00 - 80%

Maximum Titration Rate

2000 mcg/hr

Adjust and press [START OK] Key

7. **Bolus Screen**
    Do one of the following (Bolus can be ml, mg, or mcg depending on the program selected):

    *   Press [START OK] to confirm the existing parameters.

    *   Enter the desired bolus dose and press [START OK].

PCA	10:00	- 80%

    Bolus Dose

    3000 mcg

    Adjust and press [START OK] Key

8. **Bolus Titration Limit Screen**
    Enter the maximum bolus dose that can be used in the

    current protocol and press [START OK]. Bolus dose can be ml, mg or mcg depending on program selected.

PCA	10:00	- 80%

    Maximum Bolus Dose

    4000 mcg

    Adjust and press [START OK] Key

☞ NOTE: If the "Maximum Bolus Dose" screen does not appear on the pump during programming, go to the "Change Set up" menu to activate "Titration Bolus"

9. **Lock Time Screen**
    The lock time is the amount of time between patient boluses. Do one of the following:

    *   Press [START OK] to confirm the existing parameters.

    *   Enter the desired lock time in minutes and press [START OK].

PCA	10:00	- 80%

    Lock out Time

    5 Minutes
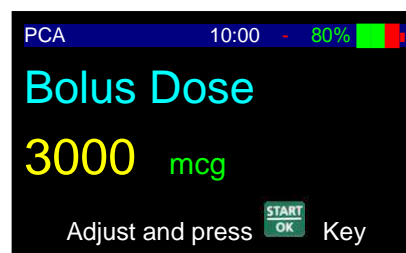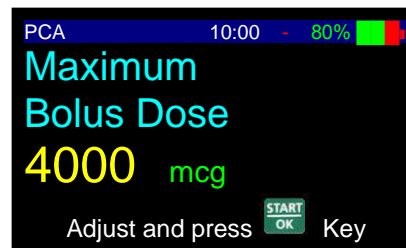
    Adjust and press [START OK] Key
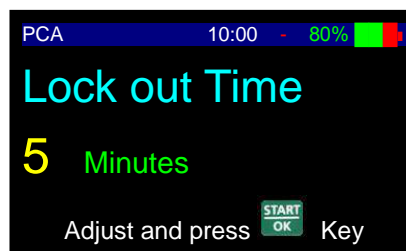
10. **Hour Limit Screen #1**
    As an additional safety precaution, user can program a volume limit over a certain amount of hours. User can set this limit for any amount of time between 1 (One) and 24 (Twenty-Four) hours, or can continue without setting a limit. The default setting is OFF, meaning there is no limit. Do one of the following:

    *   Press [START OK] to confirm the existing parameters.

    *   Enter the desired hours for the limit and press [START OK].

PCA	10:00	- 80%

    Program Limits

    Disabled

    Adjust and press [START OK] Key
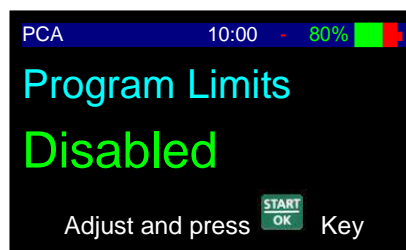
11. **Hour Limit Screen #2**
    If an hour limit is entered in previous step, the next step will propt user to enter the maximum amount of volume to be infused over that timeframe. In the screen to the right, 4 (four) was entered in the previous step for the hour limit.
    Do one of the following (Limit can be ml, mg, or mcg depending on the program selected):

    *   Press [START OK] to confirm the existing parameters.

    *   Enter the desired hours for the limit and press [START OK].

PCA	10:00	- 80%

    24 Hour Limit

    9999 mcg

    Adjust and press [START OK] Key

12. **Bag Volume Screen**
    Do one of the following:

    - Press [START OK] to confirm the existing parameters.

    - Enter the desired bolus volume and press [START OK] .

> PCA   10:00 - 80%
>
> # Bag Volume
>
> ## 100 mL
>
> Adjust and press [START OK] Key

13. **Locking Screen**
    The pump automatically locks before a PCA infusion program can be completed. Do one of the following:

    - Press [START OK] to lock the PCA program and proceed.

    - Press [STOP NO] to scroll through the programming again and review or adjust the program.

> PCA   10:00 - 80%
>
> Lock: Press [START OK]
>
> Review: Press [STOP NO]
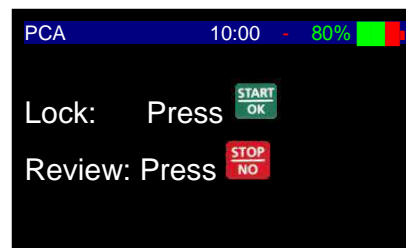
14. **Accumulation Screen**
    The pump displays the accumulation screen with a summary the program entered..
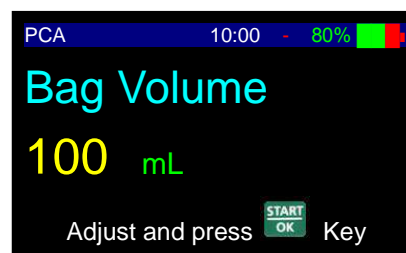
    Do one of the following:

    - Press [START OK] to confirm parameters and proceed.

    - Press [STOP NO] to go back and adjust parameters.

> PCA   10:00 - 80%
>
> | | |
> |---|---|
> | Concentration | 1500 mcg/mL |
> | Rate | 1500 mcg/mL |
> | Maximum Rate | 2000 mcg/hr |
> | Bolus | 3000 mcg |
> | Max. Bolus Volume | 4000 mcg |
> | Lock out Time | 5 Minutes |
> | 24 Hour Limit | 9999 mcg |
> | Bag Volume | 100 mL |
> | Volume Left | 100 mL |
> | Volume Infused | 0 mL |
> | Air Sensor | 0.3 mL |
> | Pressure | 730 mmHg |
>
> Press [START OK] Key to Continue

15. Press [START OK] to start infusion.

> PCA   10:00 - 80%
>
> # Start Infusion?
>
> Press [START OK] key to Start
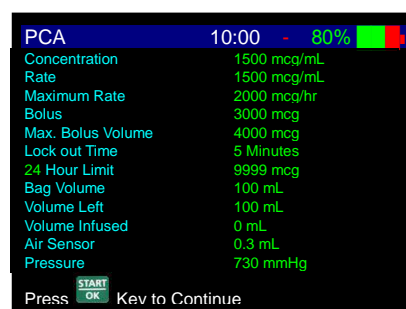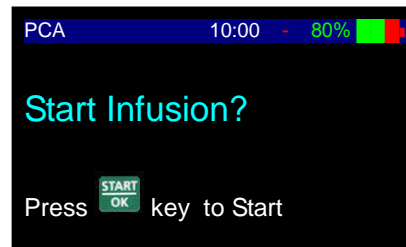
☞ NOTE: To access the PCA menu during operation, press [STOP NO] once and then hold [STOP NO] for 3 seconds.

☞ NOTE: The *VET-PRO VIP 2000™* is capable of continuous infusion (basal) rates of up to 100 ml/h. However you may use the pump for the delivery of only one drug protocol and the maximum safe ceiling for this regime could be, for example, 30mlh. Users can fix a maximum rate that the pump can be set to in 'Change Set Up' using the Technician Access Code to ensure other users cannot accidentally program the pump to deliver above this safe ceiling. See later section for 'Change Set Up'.

☞ NOTE: The *VET-PRO VIP 2000™* is capable of delivering the bolus dose at up to 1000ml/h. The default setting is 600ml/h designed to deliver any bolus as quickly as possible. Users can adjust this if they want the bolus to be delivered over a longer period in 'Change Set Up' using the Technician Access code.

Interpreting the Display Screen During PCA Infusion

Infusion Status Indicator

Infusion Mode

Programmed Infusion Rate (ml/hr or mg/ml)

Patient Controlled Bolus Volume

Battery Status Indicator

```
PCA              10:00  /  80%  ▮▮
Rate
5  mL/hr
Pt Bolus 2 mL
mmHg      360            730
```
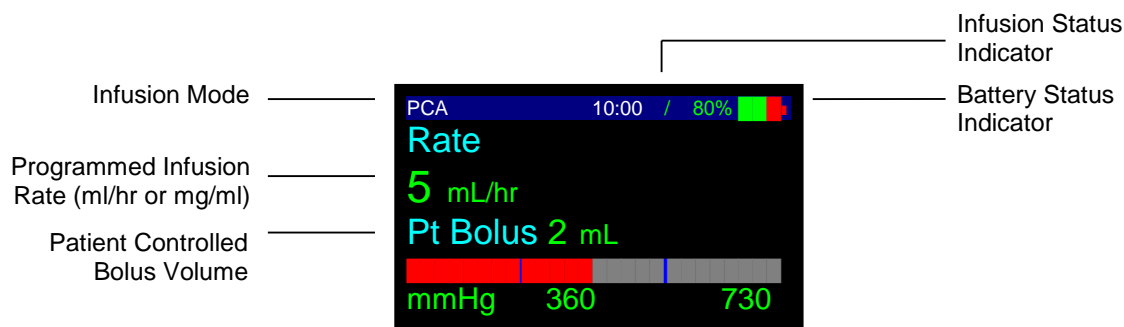
Infusion Mode
The first line of the display indicates that the pump is in the PCA infusion mode.

Infusion Rate
The second line of the display shows the current infusion rate. Depending on whether the user programmed the current protocol in mls or mgs, this will display the rate in either ml/h, mg/h or mcg/h.

Bolus Volume
The third line of the display shows the bolus volume for the current protocol. As with infusion rate, this will be displayed in ml, mg or mcg depending on how the current program is set up.

Battery Status
The battery symbol user can check the charge level by monitoring the green fill inside the symbol (i.e. completely green symbol indicates a fully charged battery).

Infusion Status
Infusion status indicator moving in circles when the pump is in operation.

Patient Activated Bolus

A PCA infusion can be programmed - much like for humans - to allow the caregiver to deliver boluses of a specified volume within predetermined time intervals for the patient. The caregiver can deliver the bolus using the keypad:

Using Keypad
Press the PRIME BOLUS button on the keypad.

☞   NOTE: User can stop bolus at any time by pressing STOP NO

☞   NOTE: If caregiver attempts to deliver more boluses than are allowed, the pump will display "Bolus Locked" and will track the amount of boluses have been requested. The bolus history can be reviewed by scrolling the Info Menu. See "Using History Functions" section of the manual

Clinician Activated Bolus

A Clinician Activated Bolus can be performed *before* starting the PCA infusion or *during* the PCA infusion.

To infuse a Clinician Activated Bolus **before** starting the PCA infusion, perform the following steps:

1. Selecting the **Prime** option from the PCA menu, the screen will show the priming screen. Select Clinician bolus option.
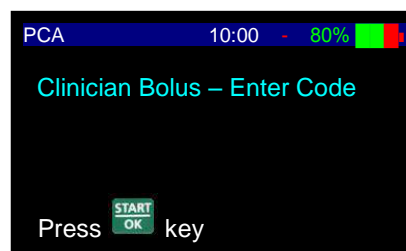
PCA	10:00	-	80%
Prime			
Program Infusion			
Clinician Bolus			
Patient History			
Review Set up			
Change Set up			

Select 5↑ , 0↓ and press START OK

2. Enter Level 2 code and press START OK .

PCA	10:00	-	80%

Clinician Bolus – Enter Code

Press START OK key

3. Enter the volume of the Clinician Bolus and press START OK to begin priming procedure. You may stop the bolus at any time by pressing STOP NO .

   The Volume for the Bolus will be in ml, mg or μg depending on the settings of the existing protocol entered for the PCA infusion. To change, go to Program Infusion in the PCA menu and follow the steps until the selection can be made for ml, mg or μg.
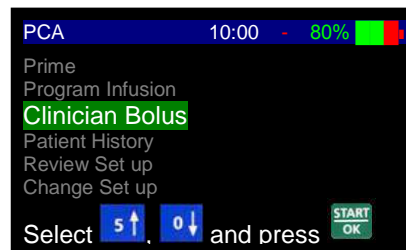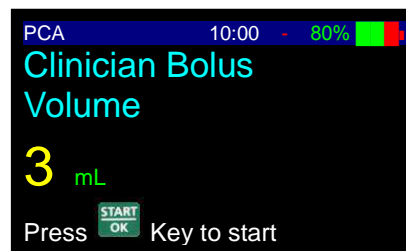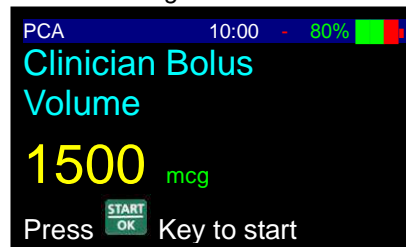
Volume in ml

PCA	10:00	-	80%

Clinician Bolus Volume

3 mL

Press START OK Key to start

Volume in mg

PCA	10:00	-	80%

Clinician Bolus Volume

50 mg

Press START OK Key to start

Volume in mcg

PCA	10:00	-	80%

Clinician Bolus Volume

1500 mcg

Press START OK Key to start

---

4. The display screen will show a graph indicating the Bolus is being infused. The graphical bar displays the amount of the bolus to be infused (clear) and the amount infused (dark).

PCA	10:00	-	80%

Bolusing

0.7   3mL
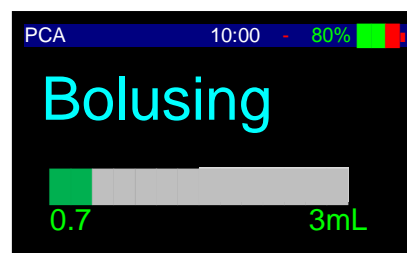
☞ NOTE: Once the bolus is completed, the display will change back to the PCA menu.

☞ NOTE: User can stop bolus at any time by pressing **STOP NO**

☞ NOTE: when the volume infused is less than the specified Hour Limit for Volume (e.g. 4 Hr Limit) the bolus will automatically stop at the volume of the total hour limit.

⚠ **Warning:** Boluses will be infused up to the full volume that is requested unless the user stops the bolus manually by pressing **STOP NO**.

To infuse a Clinician Activated Bolus **during** a PCA infusion, perform the following steps:

1. During operation, press **STOP NO** and then press **PRIME BOLUS** to stop the current infusion and initiate the Clinician Bolus.

2. Enter Level 2 code and press **START OK**.
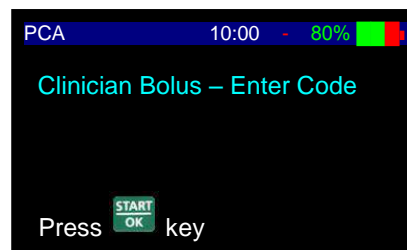
PCA	10:00	-	80%

Clinician Bolus – Enter Code

Press **START OK** key
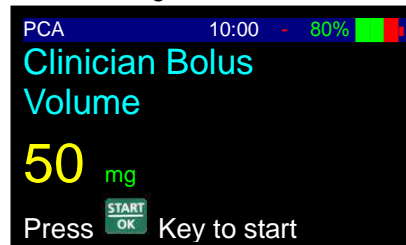
3. Enter the volume of the Clinician Bolus and press [START OK] to begin priming procedure. You may stop the bolus at any time by pressing [STOP NO].

The Volume for the Bolus will be in ml, mg or µg depending on the settings of the existing protocol entered for the PCA infusion.

Volume in ml
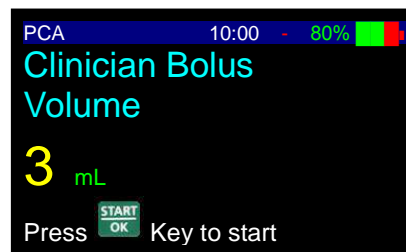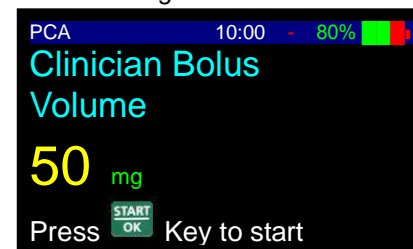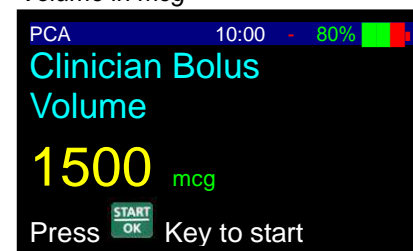
PCA   10:00 - 80%
Clinician Bolus Volume
3 mL
Press [START OK] Key to start

Volume in mg

PCA   10:00 - 80%
Clinician Bolus Volume
50 mg
Press [START OK] Key to start

Volume in mcg

PCA   10:00 - 80%
Clinician Bolus Volume
1500 mcg
Press [START OK] Key to start

4. The display screen will show a graph indicating the Bolus is being infused. The graphical bar displays the amount of the bolus to be infused (clear) and the amount infused (dark).

PCA   10:00 - 80%
Bolusing
0   50mg
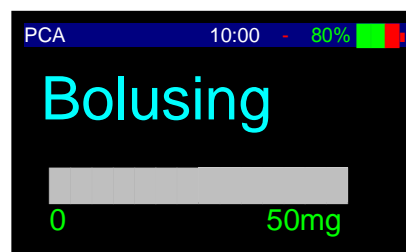
☞ NOTE: Once the bolus is completed, the pump will resume the original PCA infusion.

☞ NOTE: User can stop bolus at any time by pressing [STOP NO]

End of Infusion, Restart Infusion, or Bag Change

1. **End Infusion Screen**
Once the infusion had reached an end (pre-set volume was infused), an alarm sounds and display will show:

PCA   10:00 - 80%
End of infusion
Press [STOP NO] Key to renew
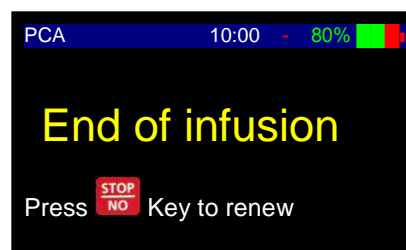
2. **KVO Display**
   The alarm will stop after 4 beeps. The pump will show the pre-set KVO rat. The alarm will sound again every 4 minutes until the user changes the bag or stops the pump.

```
PCA                10:00    -   80% ▮▮
End of infusion
Keep Vein Open
Rate 1 mL/hr
Press [STOP NO] Key to renew
```
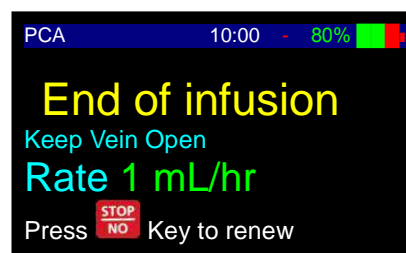
3. **PCA Restart Menu**
   This screen displays when:
   (1) The pump is turned OFF and back ON in PCA mode.

   (2) Infusion is stopped by pressing and holding [STOP NO].

   User can scroll through the following options by pressing [0↓] or [5↑].

```
PCA                10:00    -   80% ▮▮
Resume
New Bag
Menu

Select [5↑], [0↓] and press [START OK]
```

   - **Restart** – Starts infusion exactly where it left off previously.
   - **New Bag** – Restarts infusion exactly where it left off previously and updates bag volume to be equal to the bag volume originally programmed.
   - **Menu** – Brings user back to the PCA Menu.When asked for a code, enter the Unlock (L2) Code.

☞ NOTE: If using an infusion set with drip chamber, change to a new infusion bag, but make sure that the drip chamber is half filled and there is no air in the administration set. If using an ambulatory IV, PCA or Epidural set without a drip chamber, priming the line may be needed. Disconnect the set from patient before priming.

Return to PCA Menu

1. **PCA Restart Menu**

   Scroll to *"Menu"* using [0↓] and press [START OK].

```
PCA                10:00    -   80% ▮▮
Resume
New Bag
Menu

Select [5↑], [0↓] and press [START OK]
```

2. Enter Level 1 Technician Code and press [START OK].

```
PCA                10:00    -   80% ▮▮
Enter Code



Adjust and press [START OK] Key
```
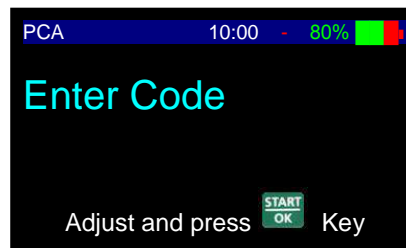
Titrating Basal Rate During The Infusion

To change Rate during the infusion, enter the new rate using the keypad and confirm the new rate by entering the **Level 1** Code. The Rate can be increased up to the "**Max Titration Rate**" programmed into the specific infusion.

Titrating Bolus During The Infusion

To change the Bolus during the infusion, press the INFO button seven times until you reach a screen showing the currently programmed Bolus in ml or mg. Use the keypad to enter the new Bolus and confirm the new Bolus by entering the **Level 1** Code. The Bolus can be increased up to the "**Maximum Bolus Dose**" programmed into the specific infusion.

Changing Lock Out Time During The Infusion

1. Stop the infusion by pressing [STOP NO].

2. Then press and hold [STOP NO] until the screen appears allowing you to access the PCA Menu.

3. Select "Menu" and enter the **Level 2** code.

4. Once in the PCA Menu, select "Program Infusion" and follow the programming instructions to adjust the program. Be sure to tell the pump that there is NOT a New Patient and the Bag Volume should NOT be reset.

Using History Functions

The *VET-PRO VIP 2000™* keeps a rolling 24 hour history of the current patient's infusion delivery. This section addresses how this can be used. There is also a 2000 event history log keeping track of the last 2000 user actions in a date and time stamped record.

While the pump is delivering medication, pressing the [info] button repeatedly will scroll through:

*   Volume Infused vs. Volume to be Infused
*   Battery Level
*   Boluses Attempted, Boluses Given & Lock Time Review for the duration of the current delivery
*   Program Review Screen - Allows user to check current program parameters without having to stop the infusion
*   Date & Time
*   Actual Pressure

Press [STOP NO] to stop infusion delivery and then press the [info] button repeatedly to scroll through:

*   Volume and Boluses Given in the Last 24 hours
*   Bolus Attempts, Given and Volume Infused Hour-by-Hour for the Last 24 Hours (use the arrow keys to navigate through the hours)
*   Chart of Bolus Delivery During the Last 24 Hours, Hour-by-Hour
*   Chart of Volume (Including Boluses) Delivered During the Last 24 Hours, Hour-by-Hour

☞   NOTE: Press [START OK] to resume infusion when you return to the 'STOP' screen.

Events Log

To access the history of events, you need to access *Change Set Up* using the Level 1 Technician Access Code. The events history carries the last 2000 user events (i.e. changes to programs, pump started/ stopped, etc) and the status of the pump (i.e. battery charge, pressure levels, etc). It is not patient specific (i.e. the 2000 events are likely to span multiple patients recently treated with that particular pump).

To access the events history:

1. From the main menu scroll to "*Change Set up*" and press [START OK].

2. From the main menu scroll to "*More …*" and press [START OK].

3. Enter the Level 1 Technician Access Code and press [START OK].

4. Scroll down to "*History*" and press [START OK].

5. The screen will now show the most current user event, date, time, etc.
   For example:

   Event Number: 12345
   01-Jan-2000 10:00

   Program Starts

   Press [info] or Details

☞ NOTE: Each event is assigned a new number and the pump stores the last 2000 in memory. After some time, the first event to appear when you enter the events history may be number 754. This means there have been 754 events in this pumps life and events 255-754 are stored in this history. The pump deletes the oldest event in the log each time a new event occurs.

6. Press [0↓] and [5↑] to scroll through events. When you find one of interest, press [info] to display further data relevant to this event on the status of the program and pump at the time of this event. The user can scroll through the information shown here to check what the pump was set up for, whether it was operating on battery or mains, whether it was locked out and what the pressure settings and readings were at that time.

Rate	416.6 mL/hr
Volume Left	100 mL
Volume Infused	0 mL
Select Program	Continuous
Operation	Battery
Battery Level	Normal
Lock Status	Keypad and Program
Volume Calibration	576
Pressure Baseline	84
Pressure Actual	84
ID Code	0
Given	1.79 mL
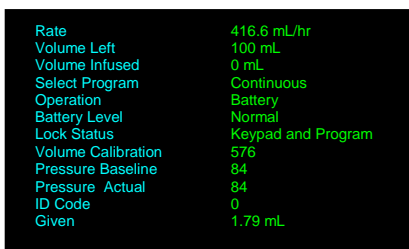
Setting Pressure Default For Down Occlusion

1. Turn the pump on by pressing and holding the [ON OFF] until the Self-Test screen appears. If air sensor is OFF, press [START OK] to confirm.

2. Pump displays program name and status. Press [START OK]. Wait for the Rate screen to display.

3. Press [info] twice.

4. Scroll to "Change set up" and press [START OK].

```
PCA                10:00   -   80% ▮▮▮
Prime
Program Infusion
Clinician Bolus
Patient History
Review Set up
Change Set up
Select 5↑, 0↓ and press [START OK]
```

5. Scroll to "Pressure Default" and press [START OK].

```
Change Set up:
Pressure Default
Select Program
Priming Rate
Maximum Bolus Volume
Bolus Titration
Bolus Rate
Maximal Rate
Select 5↑, 0↓ and press [START OK]
```

[START OK]
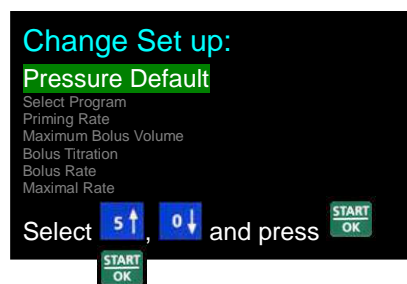
6. Set default pressure value between 100 mmHg to 1500 mmHg.

```
Pressure Level

730  mmHg

Adjust and press [START OK] Key
```
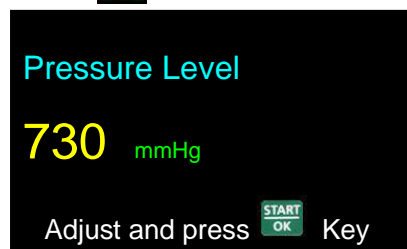
7. Press [START OK] to store the parameter in memory.

☞ NOTE:
- The selected pressure level will remain in memory until it is changed.
- The actual pressure can be viewed at any time by scrolling with the info button during operation.
- After a downstream occlusion, infusion will restart from the stop point.

Lock Mode

The *VET-PRO VIP 2000*™ provides three different level of locking:

Level A   Keypad Locking

During operation, all keys are disabled excluding the [STOP NO] and [info] key.

Level B   **Program Locking**
This feature enables the operator to lock out the setting keys, so that entered parameters and set programs cannot be changed once they are set. This option is important, for example, with children as users, when there is a danger that the child might play with the pump and unknowingly change the program; or for home-care patients who repeat the same program every day. Locking the program prevents mistakes in setting.

Level C   **Maximal Rate Locking**
This feature enables the operator to set a maximal rate for the pump to accept. The program rate then can be adjusted only up to a preset limit.

How To Lock

A – Keypad Locking

To Lock Keypad

Press and hold [lock icon] until the entire graph is black and a beep is heard. The beep indicates that the locking program is turned ON.

Continuous	10:00	-	80%

Keypad Lock Mode

OFF   ON
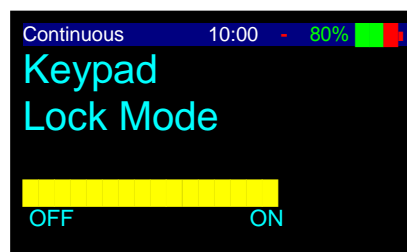
☞   NOTE: The keys are locked in memory until they are unlocked or until entering *Change setup* mode.

To Unlock Keypad

Press and hold [lock icon] until the entire graph is clear and a beep is heard. The beep indicates that the locking program is turned OFF.

Continuous	10:00	-	80%

Keypad Lock Mode

OFF   ON
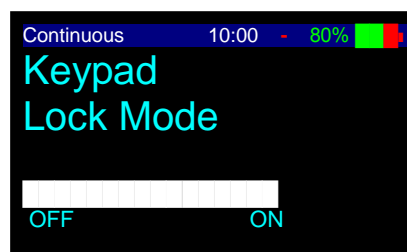
B – Program Locking

1.   Press [info] twice from STOP or setting mode.

2.   Scroll to "Program Lock" option. Press [START OK].

Volume Infused
Program Lock
Review Set up
Change Set up
History

Select [5↑], [0↓] and press [START OK]
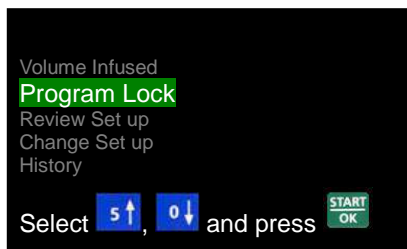
3. Enter *Change Set up* Level 2 code, using the numeric keyboard and press [START OK].

Enter Code

Press [START OK] key

4. Press [0↓] or [5↑] to change from OFF to ON and press [START OK] to approve.

Program Lock

OFF

Select [5↑], [0↓] and press [START OK]
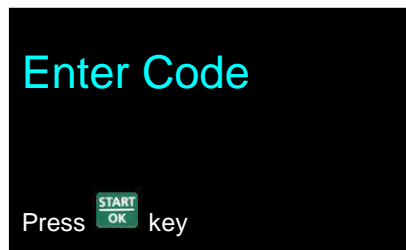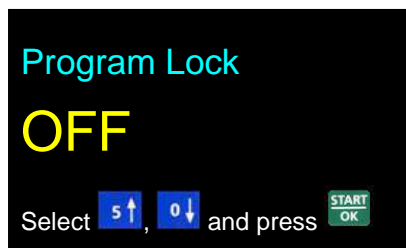
☞ NOTE: The default setting is OFF.

☞ NOTE: Unlock using the same procedure.

C – Maximal Rate locking

1. Press [info] twice from STOP or setting mode.

2. Scroll to "Change Set up" option. Press [START OK].
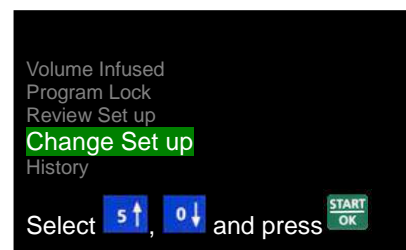
Volume Infused
Program Lock
Review Set up
Change Set up
History

Select [5↑], [0↓] and press [START OK]

3. Scroll to "More …" and press [START OK].

Change Set up:

Pressure Level
Buzzer Level
More …

Select [5↑], [0↓] and press [START OK]

4. Enter *Change Set up* Level 1 code, using the numeric keyboard and press [START OK].

Technician Code

Press [START OK] key
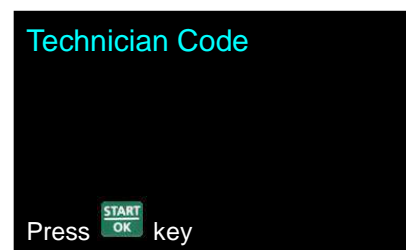
5.
Scroll to "Maximal Rate" option and press [START OK].

Change Set up:

Maximum Bolus Volume
Bolus Titration
Bolus Rate
Maximum Rate
KVO Rate
Flow Control
Set Loading Test

Select [5↑], [0↓] and press [START OK]
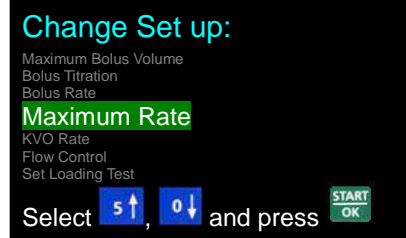
6.
Use numeric keys to set desired rate and press [START OK].

Maximum Rate

1200   mL/hr

Adjust and press [START OK] Key
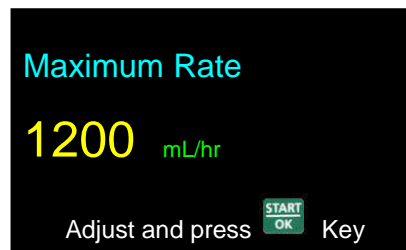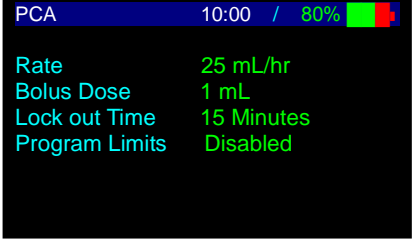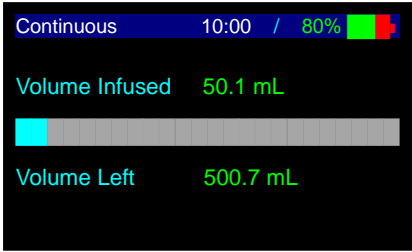
Info Mode

Access the info mode by pressing ![info] **during operation**, data setting or while in the Stop mode.

Pressing ![info] during *program operation* will display the following:

Number of Button Presses	Infusion Mode	Information	Screen
One	All programs	Infused Volume Total Volume to Be Infused	Continuous 10:00 / 80% Volume Infused 50.1 mL Volume Left 500.7 mL
Two	All programs	Battery Status	Continuous 10:00 - 80% **Battery Level** **Empty Full**
Three	Continuous, Intermittent,	Time left	Continuous 10:00 \ 80% Time Left (HH:mm) 16:48
Three	PCA	Boluses History for current program	PCA 10:00 \ 80% Boluses Attempted: 3 Given: 1 Lock out Time 10 Minutes Time to next Bolus 5 Minutes
Three	TPN	Program Status in a graphic way	UP 10:00 \ 80% Time 0:30 1:30

Number of Button Presses	Infusion Mode	Information	Screen
Four	All programs	Time and Date	Continuous 10:00 \ 80% Time 10:00 Date 01-Jan-2000
five	All programs	Actual Pressure	Continuous 10:00 - 80% Actual Pressure mmHg 100 730
Six	PCA	Data of current protocol	PCA 10:00 / 80% Rate 25 mL/hr Bolus Dose 1 mL Lock out Time 15 Minutes Program Limits Disabled

Pressing **during *data setting* or in the *stop mode***, will display the following:

Number of button presses	Information	Screen
One	Infused Volume Volume Left	Continuous 10:00 / 80% Volume Infused 50.1 mL Volume Left 500.7 mL Pressing ![STOP NO] will clear Volume Infused.
Two	Option Selection Screen	Volume Infused Program Lock Review Set up **Change Set up** History Select 5↑, 0↓ and press START OK To change parameters, select *Change setup*, press START OK and follow instructions in the Change setup section. To view current pump settings, select *Review setup*, press START OK and follow instruction in Review setup section.

☞   NOTE:

- If no selection is made within ten seconds after pressing ![info], the screen will exit the information mode and display the previous screen.

- To exit the information mode after making a selection in *Review Set up*, press ![info] once to return to the original screen.

- To exit the information mode after making a selection in *Change Set up*, press ![START OK].

Program Lock

To Adjust Lock Out Option

1. Press info twice.

2. Scroll to "Program Lock" and press START OK .

   Volume Infused
   Program Lock
   Review Set up
   Change Set up
   History

   Select 5↑, 0↓ and press START OK

3. Enter **Level 2** Code, using the numeric keyboard and press START OK .

   Enter Code

   Press START OK key

4. Press 0↓ or 5↑ to change from OFF to ON and press START OK to approve.

   Program Lock

   OFF

   Select 5↑, 0↓ and press START OK
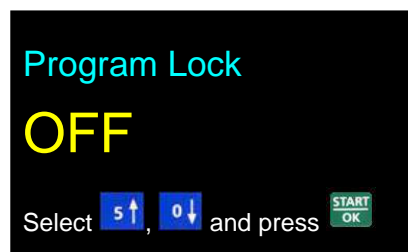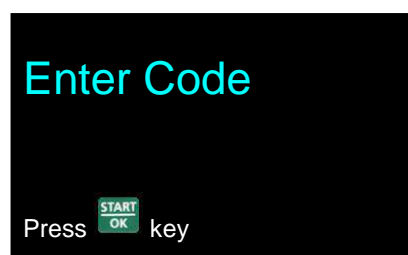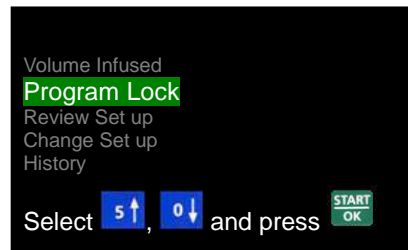
Review Set up

The Review Set up feature is designed to allow you to view the programmable options and other important information about the pump. In Review Set up, settings can be viewed, but not changed.

1. Press info twice.

2. Press 0↓ to scroll to "Review Set up" option. Press START OK and the current settings are displayed.

   Volume Infused
   Program Lock
   Review Set up
   Change Set up
   History

   Select 5↑, 0↓ and press START OK
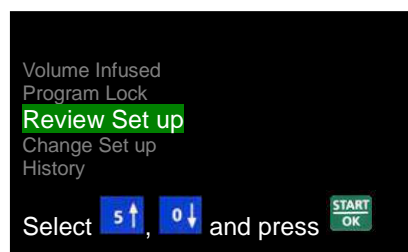
3. To view the setting for a particular option, select the desired option and press START OK .

Screen No.	Screen Display	Information
1	Battery Level	Current Battery Level (Empty >>> Full)
2	Program Lock	Option Currently ON or OFF
3	Time, Date	Time and Date
4	Buzzer Level	Current Buzzer Volume Setting
5	Pressure Level	Current Pressure Level Setting
6	Pressure Default	Current Pressure Default Setting
7	Select Program	Current Selected Program
8	Priming Rate	Current Priming Rate Setting
9	Maximal Bolus Volume	Maximal Bolus Volume
10	Bolus Rate	Current Bolus Rate Setting
11	Maximum Rate	Current Maximal Rate Setting
12	KVO Rate	Current KVO Rate Setting
13	Flow Control	Flow Control
14	Air Bubble Size	Current Air Bubble Size Setting
15	Store Last Program	Option Currently ON or OFF
16	Keystroke beep	Option Currently ON or OFF
17	Time Option	Option Currently ON or OFF
18	WiFi module	Option Currently ON or OFF
19	Caregiver Delay	Option Currently ON or OFF
20	Language	Current Pump Messages Language
21	Serial Number	Pump Serial Number
22	Production Date	Pump Production Date
23	Operation Time	Hours Since Last Service Calibration
24	Software Version	Pump Software Version
25	Volume Calibration	Volumetric Calibration Value
26	Pressure Delta	Pressure Calibration – Delta Value
27	Pressure CAP	Pressure Calibration – Cap Value
28	History	History of last events
29	Exit	Exit 'Review Set up' menu

Change Set up

The Change setup mode allows you to make changes to the adjustable parameters.

To Access Change Set up

1. Press twice.

2. Scroll to "Change Set up" option. Press [START OK].

```
Volume Infused
Program Lock
Review Set up
Change Set up
History

Select 5↑, 0↓ and press START OK
```
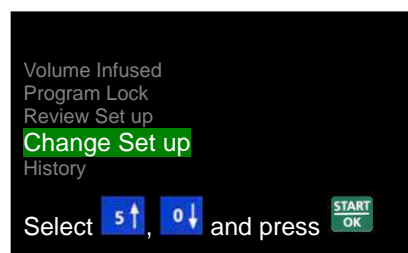
To Adjust Pressure Level or Buzzer Level

1. Press [0↓] or [5↑] to select an option and press [START OK].

'*Pressure Level*' option

```
Change Set up:

Pressure Level
Buzzer Level
More …

Select 5↑, 0↓ and press START OK
```

'*Buzzer Level*' option

```
Change Set up:

Pressure Level
Buzzer Level
More …

Select 5↑, 0↓ and press START OK
```
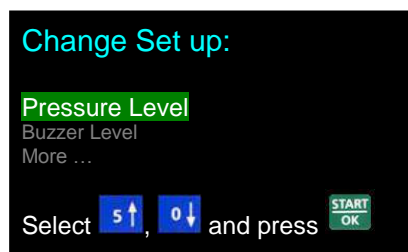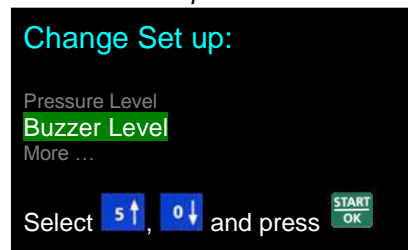
2. Make adjustment by pressing [0↓] or [5↑] and press [START OK].

To Adjust Other Parameters

1. Scroll to "More …" and press [START OK].

```
Change Set up:

Pressure Level
Buzzer Level
More …

Select 5↑, 0↓ and press START OK
```
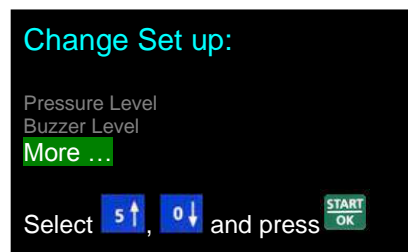
2. Enter **Level 1** Technician Code, using the numeric keyboard and press [START OK].

```
Technician Code




Press START OK key
```

3.   Press [0↓] or [5↑] to select an option and press [START OK].

Change Set up:

Air Bubble Size
Store Last Program
Keystroke beep
Time Option
WiFi module
Caregiver Delay
Language

Select [5↑], [0↓] and press [START OK]
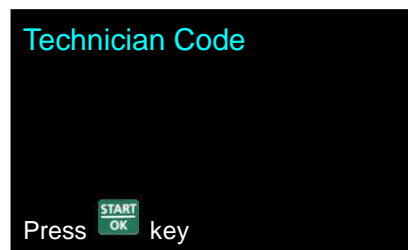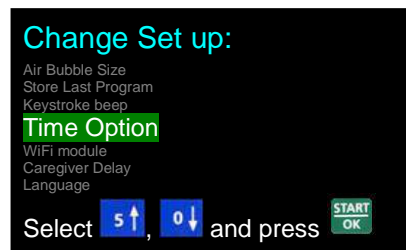
4.   Adjust the parameter by pressing [0↓] or [5↑], or by using the numeric keypad.

5.   Press [START OK] to confirm selection and the screen displays "Restart Pump".

6.   Press [START OK] to continue.

The table below indicates the adjustable parameters:

	Screen Information	Action
1	Restart pump	Restart pump
2	Pressure Default	Adjusting pressure level 100mmHg up to 1500mmHg.
3	Select Program	Select the infusion program
4	Priming Rate	Fixed value 1200mL/hr
5	Max. Bolus Volume	Set the Max. bolus volume from 0-100 ml.
6	Bolus Titration	Turn option ON/OFF
7	Bolus Rate	Set the bolus rate from 0-1200 ml/hr
8	Maximum Rate	Set the max rate from 0.1-1200 ml/hr
9	KVO rate	Set the KVO rate from 0-5 ml/hr
10	Flow Control	0-20 drops per ml
11	Set Loading Test	Turn option ON/OFF
12	Air bubble size	Set detectable size from 0.1 - 2.0 ml
13	Store last program	Turn on to clear all program parameters upon system shut-off. Turn off to save all program parameters upon system shut-off.
14	Keystroke beep	Turn option ON/OFF
15	Time option	Turn time option ON/OFF. While time option is ON, Continuous, Intermittent and 25 Steps program will be set to Volume over Time.
16	WiFi module	Turn option ON/OFF
17	Caregiver Delay	Turn option ON/OFF
18	Language	Enable changing the language of pump messages (only for models in which the software includes more than one language).
19	Set Time & Date	Set actual time and date
20	History	Indicates injection history

☞   NOTE: While the pump is in programmable mode, all parameters can be set, and parameters used in last program can be confirmed. The memory retention capability is available for the life of the internal battery.

5 – Alarm Conditions and Troubleshooting

Alarm Condition
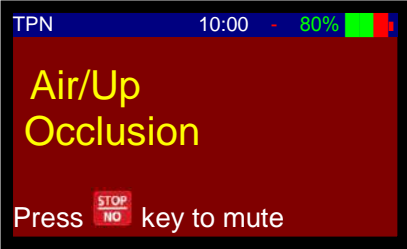
When the infusion pump detects a problem, four things occur:
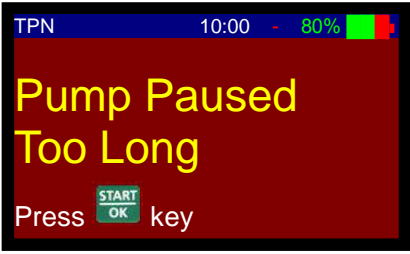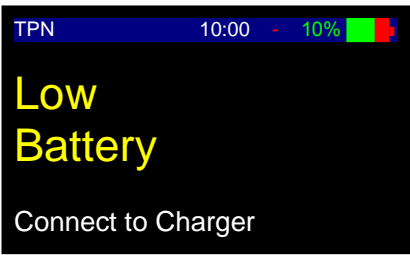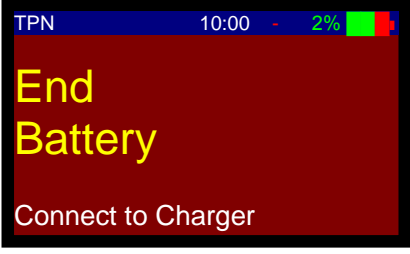
- The infusion stops

- An audible alarm is activated

- A message appears on the display screen indicating the cause of the alarm, and

- The LED indicator will change from green to red
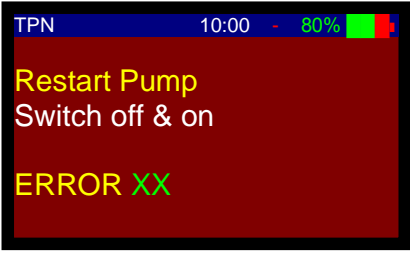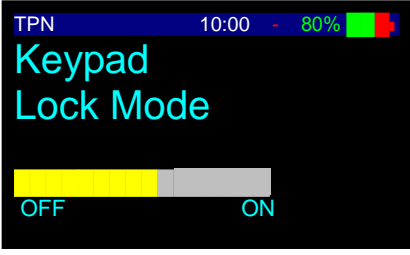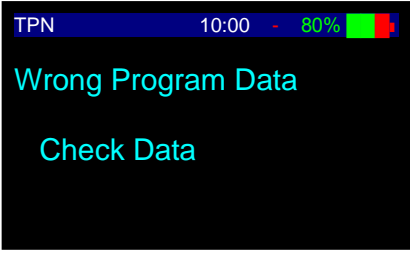
☞   NOTE: Pressing **[STOP NO]** during an alarm mutes the alarm for two minutes.

Troubleshooting

Description	Result	Possible Cause	Required Action
Air in Line TPN 10:00 - 80% Air/Up Occlusion Press [STOP NO] key to mute	Infusion stops and an alarm is activated	Air is present in dministration Set.	Disconnect line from patient, press [STOP NO]. Remove the air, as described on priming section.
		The roller or clip on the administration set is closed upstream of the pump.	Open clamp/clip.
		The line was not loaded correctly.	Re-load the IV line.
Down Occlusion TPN 10:00 - 80% Down Occlusion Check Line Press [STOP NO] key to mute	Infusion stops and an alarm is activated	The roller or clip on the administration set is closed downstream of the pump.	Open clamp/clip.
		Administration set is kinked.	Straighten the set.
		Cannula is blocked.	Change the Cannula.
		Administration set loaded incorrectly.	Re-load the IV line.
		NOTE: Operator may change pressure setting.	Refer to "Setting Down Occlusion" section.

Description	Result	Possible Cause	Required Action
Pump Unattended TPN 10:00 - 80% **Pump Paused Too Long** Press [START OK] key	An alarm is activated	Two minutes has elapsed without a button press during programming.	Press [START OK] to resume.
Door Open TPN 10:00 - 80% **Door Open** Close door	Infusion stops and an alarm is activated	The door of the pump was not closed prior to operation.	Close the door of the pump.
		The door has accidentally opened during operation.	Send the pump for service.
Low Battery TPN 10:00 - 10% **Low Battery** Connect to Charger	Pump will only run for another 30 minutes if it is not connected to mains.	30 Minutes of battery life are remaining.	Place the pump in charger and connect to mains.
End Battery TPN 10:00 - 2% **End Battery** Connect to Charger	Pump operation stops. The pump cannot be used before being connected to mains.	Battery is depleted	Place the pump in charger and connect to mains. Wait 2 minutes before operating.

Description	Result	Possible Cause	Required Action
Fatal Error TPN 10:00 - 80% Restart Pump Switch off & on ERROR XX	Infusion stops	Fatal internal error has occurred	Restart the pump. If the alarm does not stop pack the pump properly, in its original packaging, and send it for service.
End Program TPN 10:00 - 80% End of infusion Press ⬛ Key to renew	Program ends, pump will turn to KVO mode	Current infusion program has been completed.	Press ⬛ to restart a new program or turn the pump OFF.
Missing Key TPN 10:00 - 80% Missing Set Key Load Set Key & Close Door	Pump will not start	Administration set loaded incorrectly (the key was not located in its place correctly).	Reload the set into the pump as per the instructions.
		The administration set was not loaded or has been loaded incorrectly.	Change the set and load it according to instructions.
Program Lock Out TPN 10:00 - 80% TPN Locked	Setting cannot be changed	Lock Out mode is turned on.	No action required. If changing program is required, unlock the pump and refer to lock section for further instructions.

Description	Result	Possible Cause	Required Action
Keypad Lock Mode TPN 10:00 - 80% Keypad Lock Mode OFF ON	Setting keys do not function	Lock Out mode is turned on.	No action required. If changing parameters is required, unlock the keys and refer to lock section for further instructions.
Wrong TPN data TPN 10:00 - 80% Wrong Program Data Check Data	Program will not start operating	The set parameters are impossible to perform. Volume or time parameters are incorrect	Check data and change accordingly.

6 – Specifications

Pumping Mechanism:	Piston Pump
Flow Rate:	PCA: 0 to 100 ml/hr in 0.1ml increments All other programs: 0.1 to 100 ml/hr in 0.1ml, 100 to 1200 ml/hr in 1 ml increments.
Priming Rate:	1200 ml/hr
Total Infused Volume:	PCA: 0.1 to 1,000 ml. Continuous, TPN, Intermittent: 0.1 to 9999 ml 25 Steps: 0.1 to 9999 ml for each step Accumulated volume for all steps: up to 10 liters
Total Time Setting:	100 hours
Accuracy:	±3% after 15 minutes of operation. Accuracy for first 15 minutes less than ±7.5%.
KVO rate:	0 to 5 ml/hr
Air Sensor:	Ultrasonic, adjustable air bubble size OFF – 2.0 ml
Maximum Pressure:	Adjustable 100mHg to 1500mmHg (in 10mmHg increments)
Time to alarm for maximum occlusion pressure:	1h and 45 min at a rate of 0.1ml/h; 30 min at a rate of 1ml/h
Power Supply:	100-240 VAC, 50/60 Hz. 0.3A max.
Battery:	Rechargeable, Li-Polymer 7.4V, 1800mAh (Typical)
Battery Operation at 125 ml/hr:	15 hours (Rechargeable)
Battery Charging:	Automatic when clicked into the Charger that is connected to an AC power source. Six hours needed to charge a fully-depleted battery.
Alarms:	When a problem is detected, the *VET-PRO VIP 2000™* displays the following alarms:

- Air in line
- Down Occlusion
- Pump Unattended
- End Program
- Low Battery
- End Battery
- Door Open
- Fatal Error
- Lock Mode
- Lock Out Mode
- Missing Key

☞   NOTE: ⚠   When this symbol is seen, consult accompanying documents.

VET-PRO VIP 2000™ Dimensions:	112 x 89 x 40mm. (L x W x H).
Hardware Connectivity	• RS232 Serial Port (Optional) • 802.11 WiFi (Optional)

Software Connectivity	• *BodyComm*^{TM} (Optional) • Remote Monitoring System (Optional)
Classification:	Type CF Equipment (degree of protection against electrical shock), Class II
Moisture Protection	IPX3
Housing:	PC/ABS (fire retardant)
Weight:	• 280 grams without battery • 390 grams with battery
Electrical Safety:	Complies with: **EN 60601-1** (Medical Electrical Equipment Safety), **IEC 60601-2-24** (Infusion pumps and controllers), **IEC 60601-1-4** (Programmable Electrical Medical System)
Standards:	Manufactured in accordance to **ISO 9001:2008** and **ISO 13485:2003** **CE marked** (In accordance with the Medical Devices Directive 93/42/EEC)
EMC:	The *VET-PRO VIP 2000*™ infusion system is designed to be in compliance with EN 60601-1 (safety) and IEC 601-1-2 (EMC).

Environmental Specifications:

Non Operating Conditions (Transportation and Storage):

Temperature: $-25\,^{o}C$ to $50\,^{o}C$ ($-13\,^{o}F$ to $+122\,^{o}F$)

Humidity: 5 % to 100% R.H., non-condensing

Air pressure: 48kPa to 110kPa

Operating Conditions:

(The system may not meet all performance specifications if operated outside of the following conditions)

Temperature: $+18\,^{o}C$ to $+45\,^{o}C$ ($+59\,^{o}F$ to $+113\,^{o}F$)

Humidity: 20 % to 90% R.H. at $+40\,^{o}C$, non-condensing

Air pressure: 70kPa to 110kPa

IV Administration set	PVC Tubing 3x4.1mm (IDOD), shore 65 +5

7 – Service and Maintenance

Cleaning

Before connecting the pump to a patient, and periodically during use, clean the unit using a lint-free cloth lightly dampened with warm water and a mild detergent or disinfectant.

⚠ **Warning:** Always turn the pump off and remove the battery before cleaning.

⚠ **Warning:** Always unplug the charger from AC power before cleaning.

⚠ **Caution:** Do not clean the pump or charger with chemicals such as Xylene, Acetone or similar solvents. These chemicals can cause damage to plastic components and paint. Use a lint-free cloth dampened with warm water and a mild detergent or disinfectant.

⚠ **Caution:** Do not soak or immerse any part of the pump or charger in water.

Storage

If the pump is to be stored for an extended period, it should be cleaned and the battery fully charged. Store in a clean, dry atmosphere at room temperature and, if available, employ the original packaging for protection.

Perform functional tests and ensure that battery is fully charged once every three months.

Periodic Maintenance

Periodic maintenance (PM) is recommended every 1 year. The PM is designed to assure the pump's accuracy and detect and repair any potential pump inconsistencies prior to their occurrence in the field. During the PM, a biomedical engineer or trained technician should perform the following procedures:

- Clean the pump thoroughly
- Visually inspect the pump to verify its structural integrity
- Perform all the manual tests in the Change Set Up menu
- Perform calibration procedures as per the Service Manual
- Run the pump for several hours to make sure no abnormalities occur during infusion such as alarms, inaccurate infusion, and battery inconsistencies.

☞ NOTE: All operations should be performed by a certified CME technician.

☞ NOTE: It is in the technician's responsibility to repair any faults found during the PM.

Battery Operation

The *VET-PRO VIP 2000*™ pump can operate on battery power which enables operation when the patient is being moved or during electrical power failure. When the pump operates on battery power, the AC icon is off. At full charge, the standard battery provides up to 15 hours of operation at an infusion rate of 125 ml/hr.

⚠ **Warning:** Do not operate the pump on AC power if the battery is not loaded in the pump for back up.

☞ **NOTE:** When the pump is not in use, click the pump into the Charger and plug the system into an AC wall outlet (if possible) to charge battery.

☞ **NOTE:** After the "End Battery" signal has been activated or following long periods of storage, wait 2 minutes after the pump has been connected to an AC power supply before operating.

⚠ **Caution:** Leaving the battery in an uncharged state for a long period of time may damage the battery.

☞ **NOTE:** Whenever possible, use the pump connected to an AC power supply via the charging unit. This preserves the battery power supply for emergency use or for situations where the AC power is not available.

☞ **NOTE:** Replace the battery **once** every two years.

☞ **NOTE:** Hours of battery operation may vary depending on pump usage and/or the battery's condition.

LIMITED WARRANTY

The *VET-PRO VIP 2000*™ infusion pump has been carefully manufactured from the highest quality components.

Caesarea Medical Electronics Ltd. (CME) guarantees the pump against defects in material and workmanship for twelve (12) months from date of purchase by the original purchaser.

CME's obligation, or that of its designated representative under this Limited Warranty, shall be limited, at CME's option, or that of its designated representative, to repairing or replacing pumps, which upon examination, are found to be defective in material or workmanship. The repair or replacement of any product under this Limited Warranty shall not extend the above-mentioned Warranty period.

All repairs under this Limited Warranty should be undertaken only by qualified, trained service personnel. In the event that a pump is found to be defective during the warranty period, the purchaser shall notify CME or its designated representative within thirty (30) days after such defect is discovered.

The defective pump should be sent immediately to CME or its designated representative for inspection, repair or replacement. Shipping costs are the purchaser's responsibility.

Material returned to CME or its designated representative should be properly packaged using CME shipping cartons and inserts. Inadequate packaging may result in severe pump damage.

This Limited Warranty shall not apply to defects or damage caused, wholly or in part, by negligence, spilt fluids, dropping of the pump, misuse, abuse, improper installation or alteration by anyone other than qualified, trained personnel; or to damage resulting from inadequate packaging in shipping the pump to CME or its designated representative.

If, after inspection, CME or its designated representative is unable to identify a problem, CME or its designated representative reserves the right to invoice purchaser for such inspection.

This Limited Warranty is the sole and entire warranty pertaining to CME's products and is in lieu of and excludes all other warranties of any nature whatsoever, whether stated, or implied or arising by operation of law, trade, usage or course of dealing, including but not limited to, warranties of merchantability and warranties of fitness for a particular purpose. Purchaser expressly agrees that the remedies granted to it under this limited warranty are purchaser's sole and exclusive remedies with respect to any claim of purchaser arising under this Limited Warranty.

Managing Director