Please read the instructions in this manual before operating
Quick Setup

1. Set up IV set & fluids.
2. Prime IV tubing to remove air bubbles.
3. Open pump door & thread tubing into place, close & lock.
4. Connect drip counter to drip chamber.
5. Power unit by pressing \( \text{on} \).
6. Press \( \uparrow \) \( \downarrow \) keys up or down to input.
7. Select IV set-if using same type of IV set every time, enter drops/ml, this will be the default setting.
8. \( \text{Drops/ml} \) - (This option is rarely used, but a you must enter a number in the field in order for the pump to operate.)
9. \( \text{ml/hr} \) - infusion rate at ml/hr, enter number, chime will sound after entry then \( \downarrow \) down to next input program.
10. \( \text{ml} \) \( \text{limit} \) will flash - enter desired total volume to be infused.
11. \( \downarrow \) down key will flash 0 in \( \text{ml} \) \( \text{total} \)
12. Press \( \text{on} \) to start pumping.
13. KVO (Keep Vein Open) is an automatic feature of this unit preset at 1 mL per hour after infusion is complete.
14. Hold \( \text{on} \) down for 2 seconds to turn off unit after infusion is complete.
SEQUENCING THE ARROW KEYS

Pressing the ▲ & ▼ will go through the input program of the pump. The various icons will flash and call for input on the numeric keypad. If no input is needed or no change is necessary, pressing the arrow key again will take you to the next icon and continue to circle through the input program.

Starts sequence with ▼ arrow, reverse if using the ▲ arrow
Adjust - = adjustment of accuracy in minus (−)%
Adjust + = adjustment of accuracy in plus (+)%

- ▲ = select drops/ml for that type of IV set
- ▼ = desired infused. Its more common to chose ml/hour infusion rate. However a value besides 0 must be put to this field.
- ▲ = ml/hour infusion rate. Entering a value here then pushing arrow down.
- ▼ = amount desired infused. Enter amount then push down arrow
- ▲ = amount infused at a point in time while pumping. Always starts at 0. You can not enter a value in here because the number represents what has been infused. When this is flashing 0, the infusion pump can start pumping by pushing the ▼ key.
INSTRUCTIONS:
If mounting on an IV pole, use the pole holder on the back panel. Place IV pole through the opening and tighten knob firmly.

- Power source: operator will now decide if AC wall outlet is used or the battery is chosen to provide power.
  1. AC power: Plug into wall outlet. Turn power on via switch on the back panel.
  2. Press start for a second. The AC indicator should illuminate.
  3. Battery power desired: it is not necessary to plug into AC receptacle. Press for one second, the battery icon will illuminate. (fig.2) When battery is low, battery icon will flash. It will also flash “LOW BATT” in alarm section.

Figure 1
REAR VIEW
PRIME IV SET:
1. Attach IV set to IV solution with IV roller clamp closed completely.
2. Please note drip/ml on IV set packaging. Standard IV sets are 15 or 20 drops/ml, micro IV sets are 60 drops/ml.
3. Gently press drip chamber of IV set between your fingers a few times to fill chamber 1/4 to 1/3 full.
4. Release roller clamp & expel air from IV tubing. Then close roller clamp again. (See Figure 3) Roller clamp should be on IV Set below pump.

Figure 2
FRONT VIEW
Thread IV Set Through: (Fig. 3)

1. Pull metal door hinge to the left to open.
2. Leave slack in IV tubing above pump.
3. Thread tubing through portal “A”. Be sure and push completely into slot.
4. Hang tubing straight & firm, then thread through tube guides “B” through “E”. Pull clamp lever “D” to the left to open.
5. Close pump door and lock “C”.
6. Open roller clamp of IV set.

NOTE: Make sure there is no flow or dripping of IV set at distal end at this time.

Attach Drip Detector: (Fig. 4)

1. Connect drip detector coiled cord to the back panel of the pump.
2. Place drip detector over drip chamber above fluid line but below spike drip opening.
3. Keep drip chamber vertical to obtain correct drip shape. Otherwise, frequent alarms will sound.
4. Keep drip detector away from intense light or direct sunlight.
5. Make sure inside of drip chamber does not have a lot of splash or drops on its side walls.

Power On Unit

With power already on, press one second more, unit will chime & LCD display will illuminate. Unit will perform a self-check for an additional second. Self-check includes battery, drip detector & pump. If a problem exists, then an error code will show. (on LCD display, see figure 2)

ATTENTION! All alarm messages must be addressed or pump will not function. The cursor arrows allow different modes or windows to be selected. The mode will flash & new input can be entered.
Type of IV Set:
Move cursor buttons by pressing ▲ or ▼. This cursor ▼ will flash. Input the number on the keypad for the IV set: i.e. either 15, 20 or 60.
NOTE: The most common IV set is 20 drops/ml. When the cursor returns to flashing, the entry is confirmed and a different mode can be selected. That IV set drop/ml. will remain in unit memory for additional infusions until changed.
There is no need to enter this field again unless IV set drip type is changed in subsequent uses.

Input Flow Rate & Volume Unit:
Press ▲ or ▼ to move cursor to either ▼ or ▼ to enter your flow setting. When the cursor is flashing, enter flow rate desired via numeric keypad. You MUST enter a number in DROPS/M in order to cursor down to ML/H. You can then enter ML/H. The unit will adjust DROPS/M accordingly.

<table>
<thead>
<tr>
<th>TYPE OF IV SET</th>
<th>RANGE ml/hr</th>
<th>RANGE Drops/m</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 &amp; 20 drops/ml</td>
<td>1.0-999</td>
<td>1-333</td>
</tr>
<tr>
<td>60 drop/ml</td>
<td>1.0-150</td>
<td>1-150</td>
</tr>
</tbody>
</table>

Volume Limit
A desired ml infusion amount can be entered as follows:
- Move cursor arrows to ▼ LIMIT
- Enter volume desired when cursor flashes, this will also be the default setting for subsequent setting.

Keyboard Lock Function
This is a security feature. Operator may want to lock keys to avoid accidental changes to the infusion. This is optional and does not have to be done during any infusion.
Keyboard Lock Function (cont.)

Keyboard Lock:
1. Press \[\text{button}\] for 1.2 seconds to lock the system. No changes can be made to infusion parameter. The “LOC” will appear on screen. Press \[\text{button}\] for 1.2 seconds to unlock.

Start Infusion
Confirm that settings are correct. Press \[\text{button}\] button to start infusion. The flow indicator light belt \[\text{indicates flow.}\]

Finish Infusion
When the infusion reaches the volume limit, the pump gives the empty alarm \[\text{to notify the completion of infusion.}\]
At this time, keep the KVO functioning (the minimum flow rate to prevent venous occlusion).
1. Press \[\text{to stop KVO.}\]
2. If additional fluids are required either:
   a. Input a new volume setting, or
   b. Press \[\text{to clear volume limit back to “0”}\]
   c. Connect to the solution container
   d. Press \[\text{for infusion restart}\]

Turn Power Off
This unit can be turned off during operation, or after infusion is complete. Press \[\text{to stop the pump.}\] Press and hold \[\text{for 2 seconds to turn power completely off.}\]
1. Turn off power AC switch on the back of the unit.
2. Before IV set is removed, open the pump door and turn clamp lever to the left to open the tube clamp.

Selective Operations
1. To Pause/Restart Infusion:
   Press \[\text{to pause infusion.}\] Press \[\text{again to restart infusion.}\]
   ATTENTION: A pause lasting longer than 2 minutes will cause an automatic alarm “ERR 3”. Press \[\text{to clear the alarm signal, then push}\]
   \[\text{to restart the pump.}\]
Selective Operations (cont.)

2. To continue the infusion after restart is complete:
   a. Make sure that the residual volume is present in the solution container.
   b. Either change $\text{ML} \text{ LIMIT}$ to higher volume or press $\text{C}$ for 2 seconds. The $\text{ML} \text{ TOTAL}$ in the window will become “0”. Press $\text{O}$ to restart infusion.

Perform Purge

Purge is used to prime IV tubing and remove any air from the line.
- Press and hold $\text{V}$ only when pump is not running. Release hold and purge will stop.

NOTE: Purge volume is not calculated in total volume infused.
NOTE: Air in tubing may cause alarm to sound, but infusion will not stop.

Adjust Flow Unit

The “Vet Pump” allows for adjustment of flow rate for various IV sets because of the variance in the manufacturer of different brands of IV sets. A variance can also occur because of:

1. High surface tension of solutions
2. Deterioration of IV tubing due to long time use.

The best solution for adjusting for IV set variance is physiological saline.

Adjustment is best done at a common infusion rate, so select a common infusion rate, then wait for 50ml to be infused before starting adjustment changes. Press $\text{A}$ or $\text{V}$ to $\text{ADJUST} +$ or $\text{ADJUST} -$, then enter numeric value and press $\text{O}$ to start the infusion. The rate will automatically be compensated.
Battery Supply
The pump will operate in battery mode if:

1. AC cord is disconnected or AC power fails.
2. AC power switch at back of unit is turned off.

Battery life is approximately 5 hours when fully charged at 30 drops/min infusion rate. When the battery is low: Low Batt will light. The power will then shut off in less than 10 minutes if AC is not provided.

Occlusion Screw Valve
The pressure or sensitivity to where the pump will show an occlusion can be adjusted via adjustment screw on the back of the unit. Remove the black protective cap to expose the screw valve.

The pressure setting can be seen by watching the light belt on the front panel. Adjust the screw to increase or decrease the adjustments valve. There are 8 different settings in range from 40KPA to 140KPA.

Alarm Volume Adjustment
Change the alarm volume by adjusting the screw on back panel of the unit. First remove the black protective cap. Turn setting to the right to increase sound or left to decrease sound.

Toggle Switch Settings
On the bottom of the pump are a series of 5 switches. These switches are used for analysis during any repair work & should not be tampered with during normal operation.

NOTE: “ON” is down “OFF” is up. Make sure switches #2 through #5 are in user mode (OFF).

<table>
<thead>
<tr>
<th>SWITCH NO.</th>
<th>MODE</th>
<th>ON (DOWN)</th>
<th>OFF (UP)</th>
<th>FACTORY DEFAULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VOICE</td>
<td>NO SOUND</td>
<td>SOUND</td>
<td>OFF</td>
</tr>
<tr>
<td>2</td>
<td>WORK</td>
<td>ENGINEERING</td>
<td>USER</td>
<td>OFF</td>
</tr>
<tr>
<td>3</td>
<td>WORK</td>
<td>ENGINEERING</td>
<td>USER</td>
<td>OFF</td>
</tr>
<tr>
<td>4</td>
<td>WORK</td>
<td>ENGINEERING</td>
<td>USER</td>
<td>OFF</td>
</tr>
<tr>
<td>5</td>
<td>WORK</td>
<td>ENGINEERING</td>
<td>USER</td>
<td>OFF</td>
</tr>
</tbody>
</table>
**Maintenance**
Never use organic solvents, alcohol, or abrasive cleaners to clean pump. The pump can not be autoclaved or placed in an ultrasonic cleaner.

Clean with soft cloth using a mild detergent & dry well.

**Air Detector Sensor**
Gently wipe with damp cloth or swab. Be careful not to damage the sensor surface.

**Finger Cassette**
Remove the finger cassette. Wash with hot water and wipe clean. Dry and replace in the unit.

**Battery**
Charge the battery for at least 16 hours initially.
Normal battery life is 3 years
Recharge the battery before using after extended periods of nonuse.

**Charging Battery**
Connect power cord with AC power. Press for 1 second, the light will blink.
The battery will begin charging.
Press for 2 seconds to turn power off. Unit MUST be turned off for the battery to charge.
After 16 hours battery will be fully charged.
<table>
<thead>
<tr>
<th>ALARM</th>
<th>PROBABLE CAUSES</th>
<th>REMEDY</th>
</tr>
</thead>
</table>
| AIR   | IV set or line is disconnected or not set up properly.  
       | Air is somewhere in IV line.  
       | Occlusion in IV container or IV line ABOVE pump. | Check IV set flow & chamber.  
       | Close roller clamp  
       | Open pump door & check for air bubbles in IV line.  
       | Tap any bubbles back up into the drip chamber.  
       | Check IV line or set for blockage.  
       | Press the \( C \) key after determining cause and correcting it. |
| DOOR  | Pump door is open. | Close pump door and lever until it locks. |
| OCCL  | Occlusion in IV tubing or IV catheter BELOW pump. | 1. Tubing is kinked.  
       | 2. Roller clamp is closed.  
       | 3. Catheter or venipuncture needle is blocked. |
| LOW BATT | Battery voltage is low. | Promptly connect power cord into wall socket.  
       | Make sure switch is “ON” on back of the unit. |
| LOC   | The keypad buttons are locked. | Press \( \text{unlock button} \) for 2 seconds to unlock the keypad. |
| EMPTY | Infusion has finished. | 1. Replace fluid bag and adjust drip chamber fluid level.  
       | 2. Infusion is finished.  
<pre><code>   | Remove IV set from pump. |
</code></pre>
<table>
<thead>
<tr>
<th>ALARM</th>
<th>PROBABLE CAUSES</th>
<th>REMEDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Err1</td>
<td>Battery missing or failed.</td>
<td>Check battery. It may need replacement.</td>
</tr>
<tr>
<td>Err2</td>
<td>Drip detector disconnected.</td>
<td>1. Make sure drip detector is connected &amp; mounted on drip chamber. 2. Check to make sure drip sensor is not soiled or obstructed.</td>
</tr>
<tr>
<td>Err3</td>
<td>Unit has been paused for more than 2 minutes.</td>
<td>Press to continue pause or to restart infusion.</td>
</tr>
<tr>
<td>Err4</td>
<td>Leakage.</td>
<td>When in pause mode, the drip detector continues to count drops. Check IV line placement in pump.</td>
</tr>
<tr>
<td>Err5</td>
<td>IV drip counter problem.</td>
<td>IV fluid bag empty. Drip chamber has fogged or is sloping.</td>
</tr>
<tr>
<td>Err6</td>
<td>Pump is not running.</td>
<td>IV tubing is defective or not mounted properly in pump. Check the finger cassette in pump.</td>
</tr>
<tr>
<td>Err7</td>
<td>IV set drip</td>
<td>Tubing or chamber sloped. Tube clamp not opened.</td>
</tr>
<tr>
<td>Err8</td>
<td>Error IV drip setting</td>
<td>IV drip/ml setting not in accord with actual IV set.</td>
</tr>
<tr>
<td>Err9</td>
<td>Infusion abnormal</td>
<td>Check drip detector, drip chamber full, blockage in IV container.</td>
</tr>
</tbody>
</table>
OTHER TROUBLESHOOTING

Symptom

Press power does not come on:
Battery is not mounted properly
Check battery connection

Purge not possible:
Finger cassette is soiled or dirty *(Strange noise from finger cassette)*
1) Open pump door
2) Remove finger cassette & clean it
3) Rotates gear to see if it moves smoothly

Performance of air detector sensor located inside door at top channel
1) Turn power on.
2) Check if “AIR” alarms when IV set is not inserted into pump.
3) Mount an IV set and prime it. Close & lock pump door. Then check to see if the “AIR” alarm turns off.

KEYS AND ICONS

PLAY/PAUSE/START KEY
UP ARROW CURSOR KEY
DOWN ARROW CURSOR KEY
CLEAR KEY
PURGE KEY
0/EMPTY KEY
9/KEYBOARD LOCK
BATTERY ICON
AC ICON
BELT LIGHT
### Specification of JorVet Infusion pump

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Warranty</strong></td>
<td>2 year limited warranty</td>
</tr>
<tr>
<td><strong>Flowrate</strong></td>
<td>1ml/h-999ml/hr</td>
</tr>
<tr>
<td><strong>Flowrate adjustment</strong></td>
<td>0.1 ml/hr</td>
</tr>
<tr>
<td><strong>Volume infused display</strong></td>
<td>0-9999ml</td>
</tr>
<tr>
<td><strong>Volume limit</strong></td>
<td>0-9999ml</td>
</tr>
<tr>
<td><strong>Purge rate</strong></td>
<td>600ml/h</td>
</tr>
<tr>
<td><strong>IV set requirement</strong></td>
<td>standard 15 or 20 drop or micro 60 drop/ml</td>
</tr>
<tr>
<td><strong>Display</strong></td>
<td>color LCD with high backlights</td>
</tr>
<tr>
<td><strong>Occlusion pressure</strong></td>
<td>40kpa-140kpa-8 adjustment levels. 1kpa=0.145psi</td>
</tr>
<tr>
<td><strong>Drip detection method</strong></td>
<td>infrared photo beam</td>
</tr>
<tr>
<td><strong>Power source</strong></td>
<td>110v/50hz</td>
</tr>
<tr>
<td><strong>Battery</strong></td>
<td>rechargeable ni-hydrogen battery DC 12V</td>
</tr>
<tr>
<td><strong>Pumping type</strong></td>
<td>finger pump (detachable)</td>
</tr>
<tr>
<td><strong>Alarms</strong></td>
<td>air, door open, occlusion, pause, infusion complete, abnormal, leakage, tube slope</td>
</tr>
<tr>
<td><strong>Diagnostic Alarm</strong></td>
<td>low battery, damaged battery, abnormal drip detector, and abnormal peristaltic finger pump</td>
</tr>
<tr>
<td><strong>KVO (keep vein open)</strong></td>
<td>1ml/h</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>2.1kg (4.5lbs)</td>
</tr>
<tr>
<td><strong>Fluids</strong></td>
<td>most fluids except BLOOD</td>
</tr>
<tr>
<td><strong>Size</strong></td>
<td>5 1/2” (w)x 7”(d)x 9”(h)</td>
</tr>
</tbody>
</table>

**Vet Pump**

**J-1060**

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