pm
product manual

Vet/IV 2.2
Infusion Pump

RATE
VTBI
TIME   VI

MACRO
10-P
TPN   MIC

ml. / hr.

ON/OFF   PIGY

PRIME   CLEAR

SELECT

RUN/HOLD

HESKA

HESKA

SECTION 14: MAINTENANCE

SECTION 15: SPECIFICATIONS

1.1   Intended Use

The Vet/IV™ 2.2 Infusion Pump is intended for veterinary use only. This device should be used to deliver intravenous electrolyte and glucose fluids. Plasma, whole blood, or whole blood products or derivatives (*i.e.,* Oxyglobin® Solution) are not recommended for use with the Vet/IV Pump. Administration of these materials may result in failure of the AIR alarm to recognize air gaps and/or infusion of incorrect volumes of fluid.

Animals receiving any type of fluid administration should be properly monitored at all times by trained veterinary health care professionals.

The Vet/IV Pump is designed to be used only with specified IV lines, as indicated by the label on the top of the pump.

The Vet/IV Pump must be operated and maintained in accordance with procedures described in applicable product literature *(i.e.,* User Manual, package inserts, or bulletins of any kind). If, under these prescribed conditions of operation and maintenance, an aberrant delivery occurs, the user should first make certain that the appropriate infusion set for which the pump has been calibrated is being used and the pump is being operated.

2.1   Vet/IV 2.2 Infusion Pump Features

- Small, lightweight and compact
- Macro and micro infusion capabilities
- Multi-programs
- Sophisticated sensors and alarms
- Rechargeable internal battery
- Integrated mounting clamp for securing the pump to an IV pole
- Snap hook and swivel bolt for cage mounting
- Large setting keys
- Priming function

Cage Mount

Clips to Cage

Clipped Together

HESKA
1-800-464-3752
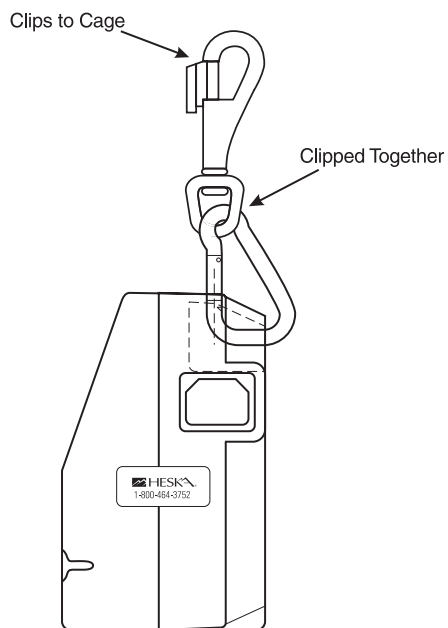
3.1 Warnings, Cautions & Notes Defined

A ⚠ **WARNING** alerts you about something that could hurt the operator or the patient.

A ⚠ **CAUTION** alerts you about something that could damage the pump or tubing.

A **NOTE** tells you other important information.

⚠ **WARNING**
This pump is a mechanical device and cannot be guaranteed against failure. For this reason, patients receiving solutions via this pump should be closely monitored.

⚠ **WARNING**
This pump should be used to deliver intravenous electrolyte and glucose fluids only. Plasma, whole blood or whole blood products or replacements (*i.e.*, Oxyglobin® Solution) are not recommended for use with the Vet/IV Pump.

⚠ **WARNING**
The Vet/IV Pump is calibrated for either Abbott Series A, Hospira® List No 11545–58 and UniverSet or Abbott Series B and Baxter ACT 5435 sets. Once calibrated, the pump cannot be used with any alternate system. Please refer to the label on your pump to ensure that the correct system is being used.

⚠ **WARNING**
This device should not be used in the presence of flammable anesthetics.

⚠ **WARNING**
Do not autoclave, ethylene oxide sterilize, or immerse in liquid. Unplug before cleaning.

⚠ **WARNING**
ELECTRICAL SHOCK HAZARD when covers are removed. Do not remove covers. Service should be performed by qualified Heska personnel only.

⚠ **WARNING**
Do not use this device in the presence of magnetic resonance imaging (MR or MRI) equipment.

⚠ **WARNING**
Ensure the device's AC rating is correct for the AC voltage at your installation site before using the pump. The AC rating is shown on the rear panel rating plate. If the rating is not correct, do not use the pump. Contact Heska's Technical Support Services for assistance.

⚠ **CAUTION**
The operator must be thoroughly familiar with the information in this manual before using the pump.

⚠ **CAUTION**
Before operation, verify that administration set tubing is not kinked or occluded.

NOTE: Operation may be affected in the presence of strong electromagnetic sources, such as electrosurgery equipment, *i.e.,* cautery.

NOTE: Operation may be affected in the presence of computed tomography (CT) equipment.

NOTE: Refer to manufacturer's guidelines for the use of IV sets.

4.1   Unpacking

1.   Carefully remove pump and accessories from box.

2.   Make sure no items were damaged during shipment.

3.   Make sure you have the following items:
    - Vet/IV 2.2 Infusion Pump
    - Hospital Grade Power Cord
    - Vet/IV 2.2 Infusion Pump User Manual (CD Format)
    - Limited Warranty
    - Cage Clip Assembly

If any items are missing or damaged, contact Heska's Technical Support Services at 800.464.3752, option 3.

4.2   Site Requirements

Pump is 100–240 VAC compatible. Pump power cord should be connected to a grounded 110 or 240 V AC outlet.

4.3   IV Set Requirements

The Vet/IV Pump is factory calibrated for either Abbott Series A/Hospira List No. 11545–58/UniverSet, Zoetis Series A or Abbott Series B, Baxter ACT 5435 IV sets, or Zoetis Series B.

⚠ WARNING

Once calibrated to either Abbott Series A, Hospira/UniverSet or Abbott Series B, Baxter IV sets, the pump should not be used with an alternate IV set.

Recalibration is required prior to use of a new IV set system. Please refer to the label on your pump to ensure that the correct system is being used.

The Vet/IV Pump is compatible with both micro and macro IV sets. It is **strongly recommended** to use standard IV sets with MACRO mode and micro IV sets with MICRO mode.

5.1   Components
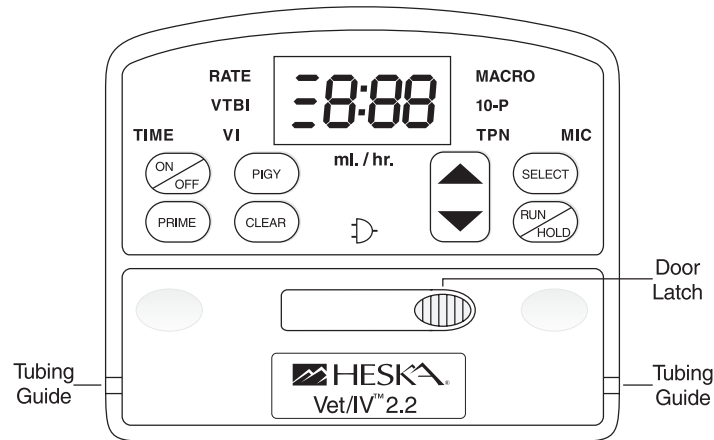
Description	Function
Display	Depending on parameter chosen, displays selected infusion rate (RATE), total time of infusion (TIME), volume to be infused (VTBI), or volume that has been infused (VI).
	When pump is operating on battery, display will flash on and off.
Cursors	Cursors moving vertically down display screen indicate that pump is infusing. Cursors run down right side of screen during MICRO infusion and down left side for all other programs.
RATE	When illuminated, the number shown on the display is current rate of infusion in ml per hour.
VTBI	When illuminated, indicates total volume to be infused.
TIME	When illuminated, indicates length of time of infusion or time remaining to complete program.
VI	When illuminated, indicates accumulated infused volume from the time CLEAR was last pressed.
ON/OFF key	Switches pump on and off.
PRIME key	Moves fluid through IV lines to remove air.
	Use Prime function during setup, before attaching lines to patient, or after door has been opened for line adjustment.
PIGY key	Sets pump to run a PIGY program.
CLEAR Key	During programming, clears displayed setting.
MACRO	Indicates that pump is operating in MACRO infusion mode.
10-P	Indicates that pump is operating in multi-program infusion mode.

TPN		Indicates that pump is operating in TPN or TPN-EASY infusion mode.
MIC		Indicates that pump is operating in MICRO infusion mode.
Charging Indicator		Lights when pump is connected to AC power.
ARROW keys		Increases or decreases infusion RATE, TIME of infusion, and Volume To Be Infused. Press and release arrow to step up or down slowly. Press and hold arrow to increase or decrease rapidly.
SELECT key		Selects program mode (MICRO, MACRO, 10-P, TPN, or TPN EASY) and pressure setting (HI, Lo, nor).
RUN/HOLD		Starts or stops pump operation and fluid delivery. May be used to silence an alarm condition and pause priming. Saves selections into memory.
Door Latch		Opens and closes pump door.
Tubing Guide		Alignment guide for administration set. Fluids should run from left to right when facing front of pump.

5.1.1 Open Front Door Components

Press door latch to open door and note components below.

No.	Description	Function
1	Latch post	Holds door closed.
2	Pressure sensor	Detects downstream tubing restriction and occlusion.
3	Pressing plate	Holds tubing in place when door is closed.
4	Pump door	Holds press plate against tubing.
5	Air sensors	Detect presence of air in administration set.
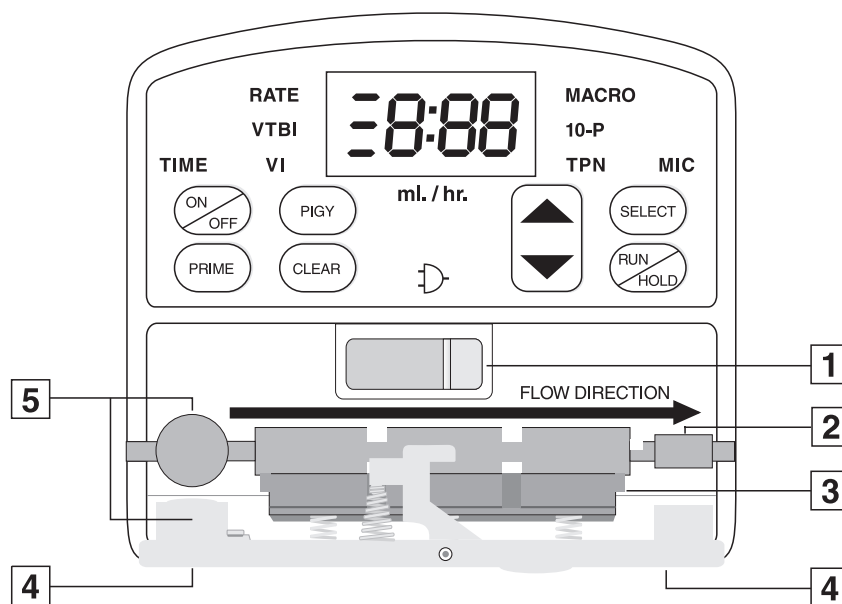
5.1.2   Rear Panel Components

No. Description Function

1   Pump hand grip   Allows pump to be easily carried.

2   Pole clamp knob   Turns clockwise to secure pump to IV pole.

3   Pole clamp   Mounts pump on IV pole.

4   Speaker   Sounds an audible alarm.

5   Electrical cord   Attachment for AC power cord 100-240V connector 50/60Hz.

6   BF protection   Safety classification.

7   Serial number   The serial number of the pump.
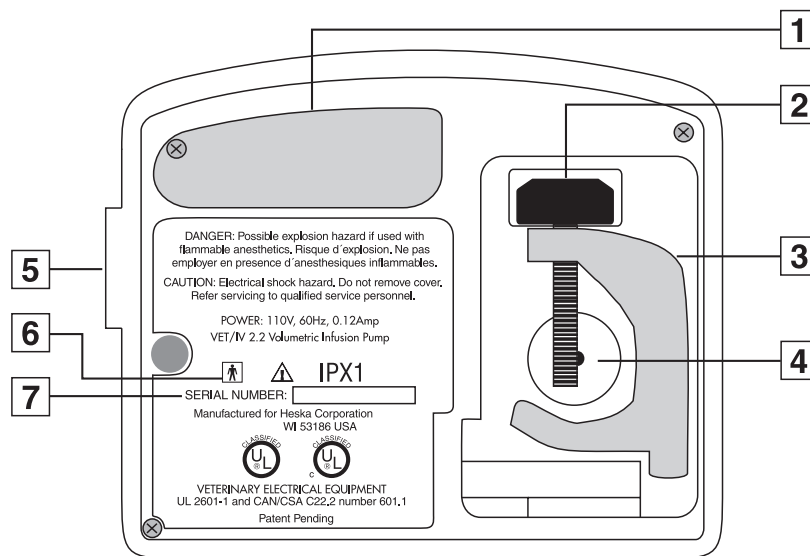
Before attaching the Vet/IV Pump to a patient, it is recommended to run the following tests to verify that all indicators and alarms work properly.

When an alarm is activated, the following will occur:

1. An alarm message appears on the display.

2. An audible alarm sounds.

3. The infusion is stopped.

6.1   Pump Operation Test

NOTE: Upon receipt, or following long periods of disuse, connect the IV pump to AC power and charge for 8–10 hours but no longer than 12 hours.

1. Press **ON/OFF** to switch on the pump. The unit should perform a self test and display [on] followed by the last rate setting. Verify that a long beep sound is heard and that all the LEDs and messages on the display are illuminated for 2 seconds. The charge indicator will stay constantly lit if plugged into AC power.

2. Press the door latch to open the door. Insert a primed administration set into the tubing guide so that fluids will flow from left to right.

3. Close the door. Press on the door recessions until a click is heard. Be careful not to pinch the administration set.

4. Press **PRIME**. During priming, the display should show [FILL].

5. Once prime is complete, wait one minute and verify that a [PUSH Run] message appears on the display.

6. Press RUN/HOLD to silence the alarm.

6.2   Air-in-Line Alarm Test

7. Press **p** to set the pump to a high rate of infusion.

8. Press **RUN/HOLD** to begin operation.

9. Turn the administration set drip chamber upside down to allow air to enter the lines.

10. When the air gap enters the system, the alarm should sound and [AIr] should be displayed on the screen.

11. Press **RUN/HOLD** to silence the alarm.

12. [Hold] should appear on the display.

6.3   Door Open Alarm Test

13. Re-orient the drip chamber and press **PRIME** to remove the air.

14. Press **RUN/HOLD** to start operation. If the AIR alarm repeats, press **RUN/HOLD** to stop operation then press **PRIME** to re-prime the system. Depending on the amount of air and the programmed rate of infusion, several primes may be required.

15. Open the door by pressing on the door latch. The [door OPEN] alarm should be displayed on the screen.

16. Close the door.

17. [Hold] should appear on the display.

6.4   High Pressure (Occlusion) Alarm Test

18. Occlude the administration set on the delivery (*i.e.*, right) side. Press **RUN/HOLD** to start operation.

19. After a few seconds the [Hi Pres] (high pressure) alarm should activate.

20. Press **RUN/HOLD** to silence the alarm.

21. [Hold] should appear on the display.

22. Release the occlusion in the line.

6.5   Charge Indicator Test

23. Disconnect the power cord from the AC power outlet and verify that the charge indicator turns off.

24. Press **RUN/HOLD** to resume operation. After one second, the display should start flashing to indicate that the pump is operating on battery power.

25. Connect the power cord to the AC power outlet. Verify that the charge indicator is on and the display has stopped flashing.

7.1 Programs

The Vet/IV Pump features 6 different programs which can be used for a variety of applications. Following are the specifications of each program.

NOTE: The pump will continuously display the program setting by highlighting the appropriate indicator on the right side of the display.

7.1.1 MACRO

MACRO Macro program.
Rate: 1 to 999 ml/hr in 1 ml increments up to 100 ml/hr, then in 10 ml increments up to 999 ml/hr.
Total volume to be infused: 1 to 9,999 ml.
NOTE: Standard IV sets are recommended for use with this mode.

7.1.2 MICRO

MIC Micro program for smaller animals or micro infusions.
Rate: 0.1 to 99.9 ml/hr in 0.1 ml increments up to 10 ml/hr, then in 1 ml increments up to 99.9 ml/hr.
Total volume to be infused: 0.1 to 2,500 ml.
NOTE: Micro IV sets are recommended for use with this mode.

7.1.3 10-P Multi-Program

10-P Special program which enables the user to program up to 10 different rate/volume combinations for a single patient. Each program starts immediately after completing the previous program. Note that you do not have to enter 10 different combinations to use this program. You may enter as few as 1 or as many as 10 programs, as needed for your patient.
Each program can be set with the following parameters:
Rate: 1 to 999 ml/hr.
Total volume to be infused: 1 to 9,999 ml.
NOTE: Total volume of all programs cannot exceed 9,999 ml/hr.

7.1.4 TPN

TPN For administration of Total Parenteral Nutrition. Allows user to set the up and down ramping time and total time of infusion.

7.1.5 TPN EASY

RATE EASY Delivers TPN with automatic 1-hour ramp-up and 1-hour ramp-down times.
Volume To Be Infused and total Time of Infusion are set by user.
Pump calculates Maximal Rate.

7.1.6 PIGY Program

Delivers fluids using two different sequential rates and volumes to accommodate piggy-back administration systems.

NOTE: Some mixing of fluids and/or back-flow of fluid from the main bag into the supplemental bag may occur with the use of this program. This is a recognized phenomenon in fluid therapy and has been noted with both pump administration and gravity feed systems. For this reason, do not use the PIGY function to administer chemotherapeutic agents or other solutions that should not be mixed.

NOTE: The Vet/IV Pump should be used to deliver intravenous electrolyte and glucose fluids. Plasma, whole blood, or whole blood products or derivatives (*i.e.*, Oxyglobin Solution) are not recommended for use with the Vet/IV Pump. Administration of these materials may result in failure of the AIR alarm to recognize air gaps and/or infusion of incorrect volumes of fluid.

8.1   Installing the IV Set into the Pump

1. Press door latch to open door.

2. Ensure that the brand of IV set is correct for your type of pump (see label on top of pump).

3. Insert IV line in guide groove so that fluids flow from left (*i.e.*, from fluid bag) to right (*i.e.*, into patient).

4. Close the door. Press on the door recessions until a click is heard. Be careful not to pinch the administration set.

8.2   Priming the System

After installing the IV line in the pump, but before attaching IV to patient, prime the line using the steps below.
1. If pump is off, switch on by pressing ON/OFF. After a short self-check, the pump will display [on] followed by the last rate setting. The program selection defaults to the last program used (MACRO, 10-P, *etc.*).

2. Press **PRIME**.
   - The display will show [FILL] and the pump will begin to prime the system.
   - Once priming is complete, the display changes from [FILL] to the last rate setting.

8.3   Basic Operation

NOTE: A [0] setting can be rapidly changed to the maximum value (*i.e.*, VTBI 9,999 ml) by pressing ▼.

NOTE: During programming, the Run/Hold alarm may sound if there is a one-minute delay in entering settings or starting infusion. Press **RUN/HOLD** to stop the alarm. The display will show [Hold]. Program the pump as needed then press **RUN/HOLD** again to begin the infusion.

1. Place the pump near the patient.

2. Connect the pump to an AC power outlet or use on battery power.

3. Verify that the administration set is installed in the pump correctly. Do not attach the IV to the patient at this time.

4. If the pump is off, switch it on by pressing **ON/OFF**. After a short self-check, [on] will appear on the display followed by the last rate setting.

5. The last infusion mode used (*i.e.*, Macro, Mic, *etc.*) will illuminate on the right side of the display. If you wish to use this mode, continue to step 6. If you wish to use a different mode. See *Section 10: Special Programs*.

6. [Rate] is illuminated on the left side of the display. Press ▲ or ▼ to set the desired infusion rate.

   • Press ▲ to increase the rate or ▼ to decrease the rate.

   • Press and hold ▲ or ▼ to change infusion rate quickly.

   If needed, press **CLEAR** to reset the display to zero.

7. If priming is needed, ensure that the line is not connected to the patient, then press **PRIME**.

8. Press **SELECT** to move to the next setting to be entered: Time or VTBI. If Rate and Time are entered, VTBI is automatically calculated. If Rate and VTBI are entered, Time is automatically calculated.

8.3.1   Program Rate and Time

1. Press **SELECT** until [Time] is illuminated.

2. Use ▲ or ▼ to set the total time of infusion.

3. Press **SELECT** one time. The calculated [VTBI] is displayed. This setting has been automatically calculated—do not change.

4. Press **SELECT** one time to display [Volume Infused]. This setting is used to periodically check your patient during fluid delivery and determine how much fluid has been administered. Note that this setting does not reset to zero when the pump is turned off. If you are starting with a new patient, press CLEAR to reset the VI to zero.

5. Continue to Step 9.

8.3.2   Program Rate and VTBI

1. Press **SELECT** until [VTBI] is illuminated.
2. Use ▲ or ▼ to set the total Volume To Be Infused.
3. Press **SELECT** one time to display [Volume Infused]. This setting is used to periodically check your patient during fluid delivery and determine how much fluid has been administered. Note that this setting does not reset to zero when the pump is turned off. If you are starting with a new patient, press **CLEAR** to reset the VI to zero.
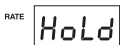4. Continue to Step 9.

9. Attach the IV line to the patient, then press **RUN/HOLD** until infusion begins (cursors run down side of display).

   NOTE: All settings are retained in memory even after the pump is turned off.

10. Verify that the infusion is proceeding normally.

11. To turn off the pump, stop operation by pressing **RUN/HOLD**, then press **ON/OFF** until [OFF] is displayed.

9.1   Checking & Adjusting Settings

9.1.1   Check Time Remaining

`SELECT` x 1

`TIME`

1. Press **SELECT** once during operation. The remaining infusion time is displayed for 5 seconds.

NOTE:
- Time remaining is stored even if the pump is switched off.
- Time remaining will automatically adjust if Total Volume is changed during operation.

`–:–`

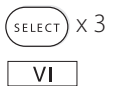- Time remaining will display as dashes if total time is more than 100 hours.

9.1.2   Check VTBI

`SELECT` x 2

`VTBI`

1. Press **SELECT** twice during operation. The remaining VTBI is displayed for 5 seconds.

2. When a program is completed, the VTBI will reset to the original programmed volume.

9.1.3   Check VI

`SELECT` x 3

`VI`

1. Press **SELECT** 3 times during operation. The volume of fluid that has been administered to the patient is displayed for 5 seconds.

NOTE: The VI will automatically reset to zero once it reaches 9,999 ml.

NOTE: **The VI does not automatically reset after the pump is turned off.** When starting with a new patient, this setting should be cleared and reset to zero during initial setup.

9.1.4   Change Settings During Operation

RATE `HoLd`

`SELECT`

▲▼

1. Press **RUN/HOLD** to halt the operation of the pump. [Hold] will appear on the display.

2. Press **SELECT** until the parameter to be changed (Rate, Time or VTBI) is illuminated.

3. Use ▲ or ▼ to change the setting as needed.

4. Press **RUN/HOLD** to resume operation.

9.1.5   Change Alarm Volume

RATE `tonE`

`SELECT`

▲▼
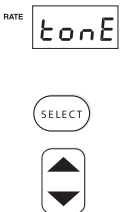
1. Press **ON/OFF** and allow the pump to complete its initial startup phase (*i.e.*, the last rate setting is displayed).

2. Hold down **SELECT** for approximately 2 seconds, until [Tone] is displayed, then release.

3. Use ▲ or ▼ to adjust the alarm volume. Volume settings range from 1 to 7, with 7 being the loudest. When the desired setting is reached, press **SELECT** again to return to the main display.

10.1   Select Infusion Modes and Pressure Settings

1. With the pump off, press and hold **SELECT**.

2. Press **ON/OFF** *quickly* then release.

3. [SLCt] shows on the display. Release **SELECT**.

4. Press **SELECT** to scroll through the available infusion modes. The following modes are available:

MACRO	MIC (Micro)	10-P	TPN	TPN Easy

5. When the desired mode is illuminated on the right side of the display, press **RUN/HOLD** to store the selection in memory.

6. The display changes to [PrES] followed by the last selected pressure setting [HI, Lo, nor]. Press **SELECT** to scroll between High, Low, or normal infusion pressures.

   NOTE: This setting determines the pressure point at which the occlusion alarm is sounded. See *Pressure Settings Definitions* in this section for details. Rate, volume, *etc*. are not affected by this setting.

   NOTE: The HI pressure setting is recommended for almost all conditions, to minimize unnecessary alarming.

7. When the desired pressure setting is displayed, press **RUN/HOLD** to store the setting in memory.

8. Continue programming Rate/Time or Rate/VTBI as usual.

10.2   Pressure Settings Definitions

Low = 0.4 bar (6 psi) – for geriatrics, neonates, patients with fragile veins

Normal = 0.6 bar (8 psi)

High = 0.8 bar (12 psi)
**Recommended setting for most patients.**

NOTE: The pump recalls programmed pressure settings indefinitely until they are changed by the operator. Once new pressure settings are stored in any program, previous settings in all programs are erased.

10.3   10-P Program

1. Set up the pump as usual, choosing 10-P as the infusion mode.

2. The display shows [P-1], followed quickly by [0] (zero). Rate will be illuminated on the left side of the display. This indicates that you will be setting the first rate/volume combination in the 10-program series, starting with the first infusion rate.

3. Set Rate and VTBI as previously discussed, pressing **SELECT** after each entry.

   NOTE: Use **SELECT** to move between parameters and enter settings. **Do not press RUN/HOLD** until you have entered all desired programs and are ready to begin infusion.
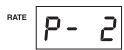
RATE $\boxed{P-2}$ 4. After entering RATE and VTBI for Program 1, press **SELECT** to continue to the next program. [P–2] (Program #2) appears on the display.

5. Set the Rate and VTBI for the second program.

6. Continue until all desired programs are set. A maximum of 10 programs can be stored with a total infusion volume of 9,999 ml.

(RUN/HOLD) 7. At the last entry, *do not press SELECT*. Instead, press **RUN/HOLD** to save the final setting and begin infusion.

Example of 10-P Program Settings:

Program	Rate	VTBI
P–1	5 ml/hr	5 ml
P–2	60 ml/hr	150 ml
P–3	5 ml/hr	10 ml
P–4	40 ml/hr	100 ml
P–5	5 ml/hr	8 ml
P–6	50 ml/hr	75 ml
P–7	5 ml/hr	3 ml
P–8	60 ml/hr	90 ml
P–9	100 ml/hr	100 ml
P–10	5 ml/hr	5 ml

NOTE: Maximum Total Volume for VTBI 9,999 ml

10.4   TPN Program

$\boxed{TPN}$ 1. Set up the pump as usual, choosing TPN as the infusion mode. The TPN indicator will illuminate on the right side of the display, and the Volume To Be Infused indicator will be lighted on the left side.

2. Using ▲ or ▼, enter the values for the total VTBI and press **SELECT**.

**RATE** $\boxed{UP.\ t}$ 3. The message [UP.t] (up time) is displayed, followed quickly by [0:00]. Enter the desired ramp-up time using ▲ or ▼, then press **SELECT**.
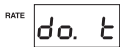
RATE $\boxed{do.\ t}$ 4. The message [do.t] (down time) is displayed. Enter the desired ramp-down time using ▲ or ▼, then press **SELECT**.

RATE $\boxed{to.\ t}$ $\boxed{RATE}$ 5. The message [to.t] (total time) is displayed, followed by the sum of the previously entered Up Time and Down Time. Use ▲ or ▼ to set the required total time of infusion. If needed, use ▲ or ▼ to adjust this setting to the total time of infusion (*i.e.*, ramp-up time + infusion time + ramp-down time).
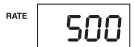
RATE $\boxed{500}$ 6. Press **SELECT** once more. The calculated maximum rate is displayed.

(SELECT) 7. Press **SELECT** again to display the volume that has already been infused. Clear this value if beginning with a new patient.
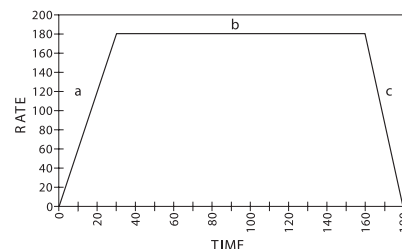
(RUN/HOLD) 8. Press **RUN/HOLD** to begin infusion.
Example Program Setting:
Data Setting
1. Total volume: 480 ml
2. Ramp-up time (a): 30 min.
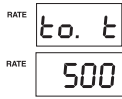3. Ramp-down time (c): 10 min.
4. Total time (a + b + c): 180 min.

Result Calculated: Max rate: 180 ml/hr

10.4.1 TPN EASY Program

 RATE `EASY`

1. Set up the pump as usual, choosing TPN EASY as the infusion mode. The TPN indicator will illuminate on the right side of the display, and [EASY] will appear on the screen.

2. Set the values for the total VTBI using ▲ or ▼, then press **SELECT**.

 RATE `to. t`
RATE `500`

3. The message [to.t] (total time) is displayed, followed quickly by [2:00], the sum of the built-in up and down ramping times. Using ▲ or ▼, adjust the time to reflect the total time required for infusion.

4. Press **SELECT** again. The calculated maximum infusion rate is displayed.

 (SELECT)

5. Press **SELECT** again to display the volume that has already been infused. Clear this value if beginning with a new patient.

 (RUN/HOLD)

Press **RUN/HOLD** to begin infusion.

10.5 PIGY Program

NOTE: Some mixing of fluids and/or back flow of fluid from the main bag into the supplemental bag may occur with the use of this program. This is a recognized phenomenon in fluid therapy and has been noted with both pump administration and gravity feed systems. For this reason, do not use the PIGY function to administer chemotherapeutic agents or other solutions that should not be mixed.

NOTE: PIGY refers to the supplemental IV bag that is situated higher on the pole than the main bag (see illustration). These fluids will be administered first due to the higher pressure of gravity.

NOTE: When the fluids in the PIGY bag are depleted, the system will begin to deliver the fluids in the main bag even if the pump is still operating under PIGY settings. The reverse is also true: if the PIGY bag contains more fluid than the PIGY settings are programmed to deliver, the excess PIGY fluids will be administered using the settings for the lower bag. For the PIGY program to function as expected, the PIGY bag must contain exactly the amount of fluid that the PIGY program is set to deliver.

 (PIGY)
RATE `PIGY`

1. Set up the pump as usual for administration of the main (lower) bag of fluids, but *do not press RUN/ HOLD* at the end of programming. Instead, press **PIGY**. [PIGY] will appear on the display, followed by the last PIGY rate setting.

 ▲▼

If the primary program is already running, press **RUN/HOLD** to stop operation before pressing PIGY.

2. Using ▲ or ▼, adjust the Rate setting for the PIGY bag.

 (SELECT)

3. Press **SELECT** to continue.

4. Display shows last [VTBI]. Adjust the setting as needed using ▲ or ▼.

 (RUN/HOLD)

5. Press **RUN/HOLD** to start the PIGY program.

NOTE: The display screen will intermittently flash [PIGY] when operating in PIGY mode.

NOTE: Once the PIGY program is complete, the pump will return automatically to the primary program.
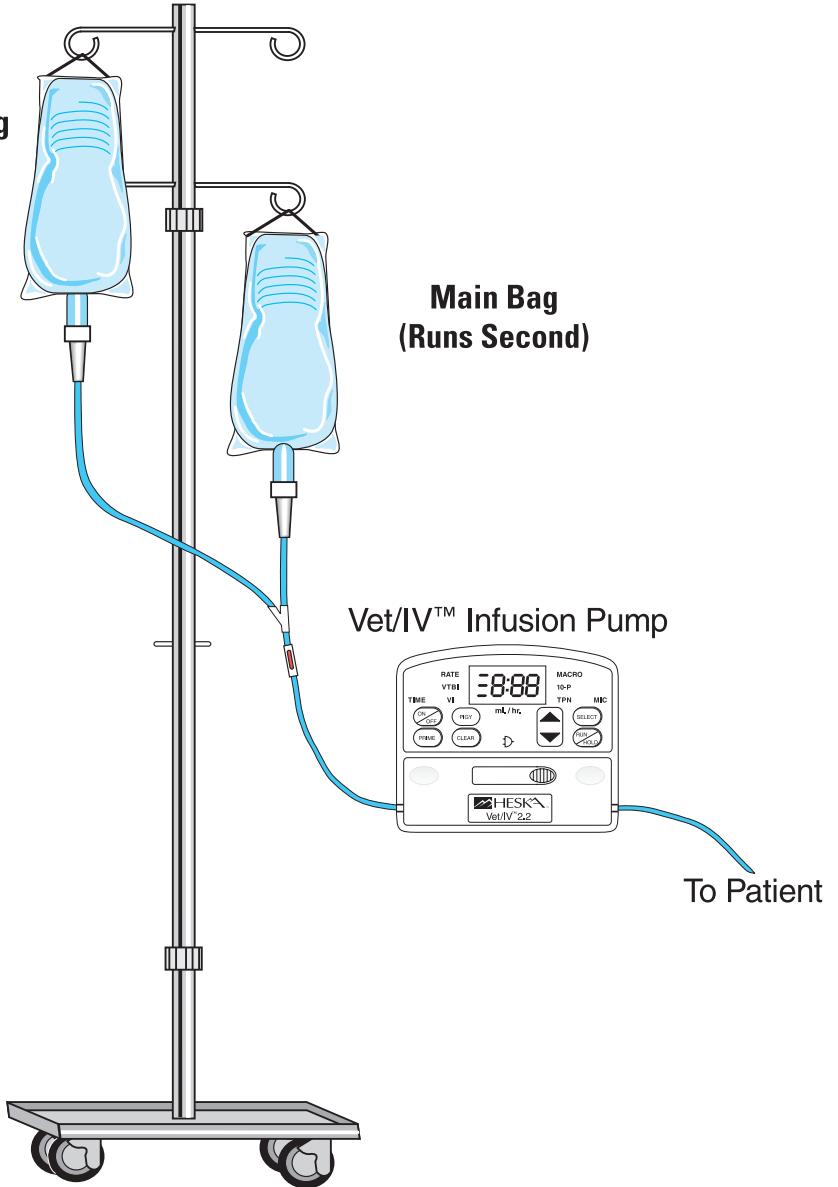
**Supplemental (i.e., PIGY) Bag
(Runs First)**

**Main Bag
(Runs Second)**

Vet/IV™ Infusion Pump

To Patient

The Vet/IV Pump has a unique feature that enables the user to lock the setting keys. This option prevents settings from being changed during pump operation.

11.1   Locking

The Vet/IV Pump lockout function will disable all except SELECT, which may be used to check the progress of the infusion.

To lockout a program:

RATE `Loc` At any time during operation, simultaneously press and hold ▲ and ▼. The display will show [Loc], accompanied by a short beep.

When [Loc] is displayed, you may press **SELECT** and scroll through the various parameters, but changes cannot be made to the settings until [Loc] is disabled.

NOTE: [Loc] will flash on the screen when operating inlockout mode.

NOTE: This option can only be activated while the pump is operating.

11.2   Unlocking

To deactivate or exit the lockout function, simultaneously press and hold ▲ and ▼. The display will show [Loc Off].

NOTE: The locking function can only be deactivated while the pump is operating.

12.1   Battery Operation

The Vet/IV Pump can operate on either AC power or an internal rechargeable NiCad battery, enabling continuous infusion when the patient is being moved or during electrical power failure. When the pump runs on battery power, the CHARGE indicator does not illuminate and the display continually flashes.

12.2   Prior to First Use

⚠ **Important:** New pumps are shipped fully charged, but due to slow discharging during storage and shipping, it is necessary to charge the battery before use. To fully charge the battery, connect the pump to an AC power source for approximately 8–10 hours, but **no longer than 12 hours**.

NOTE: See Battery Maintenance in this section for instructions on prolonging the life of your battery.

There are two battery alarm conditions:

RATE	Lo
RATE	BAtt
RATE	End
RATE	BAtt
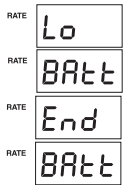
1. Approximately 15 minutes before the battery runs out, a beep sounds every 15 seconds and [Lo Batt] (low battery) appears on the display.

2. If the battery runs out, [End Batt] (end battery) appears on the display. If this occurs, the pump may also alarm or display error messages. Plug the unit into AC power immediately then press **RUN/HOLD or OFF** as needed. With the unit off, allow the unit to charge for 8–10 hours but **no longer than 12 hours**.

⚠ CAUTION
Leaving the battery in a discharged state for a long period of time may damage the battery.

12.3   Battery Bimonthly Maintenance

Bimonthly maintenance is recommended for IV pumps that are used infrequently or that always remain plugged in when delivering fluids to patients.

1. IV pump should not be delivering fluids to a patient when this maintenance is performed.

2. Set up a bag of fluids to recirculate. The easiest way to do this is to cut a small hole in the top of the bag and place the end of the IV line back into this bag.

3. Insert the IV line into the guide groove and close the door. Set the rate for 120ml/hr and the time for 6–7 hours.

4. Disconnect the IV pump from AC power and run the pump until the [LO BATT] message is displayed.

5. Power the IV pump off and connect the IV pump to an AC power source for approximately 8–10 hours, but **no longer than 12 hours**, and then resume normal use.

NOTE: If IV pump is regularly run on battery power and then recharged for 8–10 hours, this bimonthly maintenance is optional.

12.4   Battery Conditoning

If the battery has been allowed to discharge completely, [END BATT] message is displayed, or the IV pump has not been used for an extended period of time, the IV pump may no longer exhibit the expected battery life. Battery conditioning may restore battery performance. Perform the following procedure to condition the IV pump battery.

1.   Charge the IV pump on AC power for 8–10 hours. **DO NOT** use the IV pump during this charge time.

2.   Following the charge, set the flow rate to 120 ml/hr and run the IV pump on battery power for 6–7 hours using a re-circulating bag of fluids (see steps 1–3 above under *Section 12.3, Battery Bimonthly Maintenance*). If battery is functioning properly, the IV pump should be able to run on battery power at a flow rate of 120 ml/hr for 6–7 hrs.

3.   If pump cannot sustain a flow rate of 120 ml/hr for 6–7 hours, [END BATT] message is displayed, or pump does not function, repeat steps 1 and 2, up to a total of 3 times.

4.   If after 3 charge cycles the IV pump still cannot sustain a flow rate of 120 ml/hr for 6–7 hours on battery power, the IV pump battery will need to be replaced. Contact Heska's Technical Support Services at 800.464.3752, option 3 for further assistance.

13.1   Alarms & Messages

Problem	Causes	Solutions
Door won't open	1. Are edges of door sticky or dirty? 2. Line has been incorrectly installed, jamming pressing plate.	1. Clean with alcohol-moistened cotton swabs. 2. Return for service.
Door won't close	1. Are the door hinges broken?	1. Return for service.
Dead battery	1. Test for power cord function. Does the battery icon light up when the unit is plugged into AC power? 2. Has unit been idle for extended period of time? If so, battery may need conditioning. If battery has been conditioned and still does not function, phone Heska's Technical Support Services for assistance.	1. No = power cord may need to be replaced. Contact Heska's TSS for assistance Yes = Power cord functioning; proceed to Step 2. 2. Conditioning procedure: See *Section 12: Battery Operation & Maintenance*..03 **NOTE:** If the battery drains completely and [END BATT] is displayed, the unit may display irrelevant error messages or alarm inappropriately. Perform battery conditioning procedure.
Incorrect delivery	Is the correct brand of IV line being used (*i.e.,* Abbott Series A/Hospira List No 11545–58/UniverSet or Abbott Series B/Baxter ACT 5435s depending on IV pump calibration)? Is the IV set appropriate for the mode being used (Macro mode with standard sets, Micro mode with micro sets)?	If correct brand and type of lines are being used, contact Heska's Technical Support Services for assistance.
RATE $\boxed{Air}$	1. Air is present in administration set. 2. Fluid bag is empty. 3. Occlusion between bag and pump. 4. Incorrect IV set. 5. Tubing worn in area of pump. 6. Dirt on air sensors. 7. IV line is pinched off by door.	1. Disconnect administration set from patient, remove air by pressing **PRIME** or letting fluid flow out the end of the IV line. 2. Disconnect IV set from patient. Replace fluid bag. Remove air by pressing **PRIME** or letting fluid flow out the end of the IV line. 3. Check for kinks or obstructions both upstream and downstream of the pump. Ensure that the line does not become pinched. Ensure roller clamp is open. 4. Ensure that IV set is correct for calibration of pump (*i.e.,* Abbott Series A/Hospira List No 11545–58/UniverSet or Abbott Series B/Baxter ACT 5435s) and for mode being used (Macro mode with standard sets; Micro mode with micro sets). 5. Slide tubing so that a new area is inside pump. 6. There are two air sensors. The door sensor is a round piece on the left side of the pump door and the front panel sensor is located in the depression behind the IV line where the door sensor inserts. Check both sensors for cracks or damage. Clean both sensors with alcohol. 7. Reposition line.

Alarm	Causes	Solutions
RATE **door** RATE **OPEN**	1. Pump door was not closed prior to operation. 2. IV line pinched in door preventing closure. 3. Door is not able to close. 4. Door magnet missing.	Turn pump off. Adjust lines and check condition of door, especially hinges and magnet. The magnet is located in a small depression near the inside top of the door. Check that the magnet is in place. If it is not, it may be stuck to springs. Replace magnet if needed. It is essential that the magnet be replaced in the correct orientation. Contact Heska's Technical Support Services for assistance with replacing door magnet. Close door and restart operation.
RATE **FILL**	Pump is priming the administration set.	Set infusion parameters and press **RUN/HOLD** to restart infusion.
RATE **Fin** RATE **OPEN** RATE **VEIN**	Preset volume has been administered, and pump has changed to KVO (Keep Vein Open) mode. While in this mode, pump continues to infuse a small volume of fluid through the catheter to keep it patent. Pump will remain in KVO mode until fluids run out.	1. Press **RUN/HOLD** to pause. 2. Press SELECT to confirm or choose new settings. 3. Press **RUN/HOLD** to start infusion. 4. Switch off the pump to terminate infusion.
RATE **Hi** RATE **PrES**	Tubing: 1. IV set is not correct for calibration of pump. 2. IV set is kinked. 3. Catheter is not positioned well in vein or is not patent. 4. Roller clamp closed. Pressure set to Lo or nor.	1. Ensure that correct type of IV set is used. 2. Replace or straighten IV set. 3. Reposition or replace IV catheter. 4. Open roller clamp. **NOTE**: Pump has an antibolus system, which prevents a bolus delivery to the patient once a downstream occlusion is released. Set unit on HI. HI is recommended for most patients.
RATE **PUSH** RATE **run**	More than 1 minute has elapsed between programming and command to [Run].	1. Press **RUN/HOLD** once to pause or twice to continue infusion. 2. Switch off to terminate infusion.
RATE **bAd** RATE **VOL**	Display in TPN program—values entered are mathematically incorrect.	Enter correct values and begin program.
RATE **Lo** RATE **BAtt**	Approximately 15 minutes of battery life are left.	Connect pump to AC power; recharge battery.
RATE **End** RATE **BAtt**	Battery is exhausted.	Perform battery conditioning procedure. See *Section 12: Battery Operation & Maintenance*.
RATE **Err**	1. Battery dead. 2. Pump has been dropped or immersed in liquid. 3. Holes in keypad may have allowed liquid to enter the unit.	1. Recharge and try again. 2. Call Heska's Technical Support Services for assistance. 3. Call Heska's Technical Support Services for assistance.
RATE **b**	After 500 hours of being plugged into A/C power, the pump will automatically discharge and recharge the battery.	No action is required.

Alarm	Causes	Solutions
RATE **bAd** RATE **SYS**	Tubing: 1. IV set is not correct for calibration of pump. 2. IV set is kinked. 3. Catheter is not positioned well in vein. 4. Roller clamp closed. 5. Tubing within pump is worn. Overheating/failing pump motor. Battery: Exhausted.	1. Ensure that correct type of set is used. 2. Replace or straighten administration set. 3. Reposition or replace IV catheter. 4. Open roller clamp. 5. Slide tubing so that new area is within pump. **NOTE:** Pump has an antibolus system; prevents a bolus delivery to the patient once a downstream occlusion is released. Switch pump off and allow to cool for 30 minutes. If error continues to occur, phone Heska's Technical Support Services for assistance. Connect pump to AC power; perform battery conditioning procedure.
RATE **FILL** RATE **SEt**	1. IV set has not been primed. 2. Large air bubbles in lines.	Prime the set.
RATE **Loc**	Pump is in LOC mode (disables all settings keys so parameters cannot be changed).	To deactivate, simultaneously press ▲ and ▼ while pump is running. Display will show [Loc Off].
RATE **SEt** RATE **rEPL**	1. No IV line detected. 2. IV line is compressed. 3. Malfunction on pressure sensor.	1. Place line in pump. 2. Place a new section of line in pump. 3. Call Heska's Technical Support Services for assistance.

14.1   Cleaning

1.   Moisten a soft cloth with alcohol or a mild general cleaner and wipe all external surfaces.

2.   Moisten a cotton swab with alcohol or cleaner and remove any residue or crystallization in the door area.

NOTE: Do not spray cleaner directly onto the pump. Excess liquid may enter the pump and cause a malfunction. First dampen the cloth or swab with cleaner then use the cloth or swab to clean the pump.

14.2   Supplies & Accessories

Catalog #	Description	Quantity
#4010	Hospital Grade Power Cord	1
#6110	Vet/IV 2.2 Infusion Pump User Manual (CD Format)	1
#6106	Cage Clip Assembly	1

14.3   Ordering Information

For information on ordering the Vet/IV 2.2 Infusion Pump, contact:

Heska Corporation
3760 Rocky Mountain Avenue
Loveland, CO 80538
800.464.3752, option 1

NOTE: The power cord provided with your IV pump will accommodate 100–240 V AC but the plug configuration may not be appropriate for your area. Plug conversion may be necessary to accommodate your receptacle type.

14.4   Service and Repair Policy and Procedures

If your Vet/IV 2.2 Infusion Pump is not functioning properly, contact Heska's Technical Support Services at 800.464.3752, option 3. When calling, have the device model and serial number ready.

If your device should need repair after speaking with Heska's Technical Support Services, please follow the instructions provided below.

1.   A Return Goods Authorization (RGA) number is required to return a product for repair service. To obtain a return authorization number, please call 800.464.375, option 3.

   NOTE: Shipments received without an RGA number will become the property of Heska and Heska shall have no obligation to replace, repair or return such product. Shipments not displaying an RGA number or shipments sent "freight collect" will be rejected.

2.   Heska shall bear the cost of all shipping, handling and transit insurance expenses incurred for pumps covered under warranty. For non-warranty repairs, customer is responsible for all shipping, handling and transit insurance expenses.

3.   Pack the device carefully in its original case to prevent shipping damage. Do not send accessories (power cord, cage clip, *etc*.) unless specifically requested.

4.   Write the RGA number on the outside of the shipping box.

5.   Mail the box to the address below, Attention: Service Department.

6.   The customer must make all claims for damage or a lost shipment directly to the carrier.

7.   See the *Returned Goods Policy* set forth in Heska's *Terms and Conditions of Sales;* for more details visit www.heska.com.

14.5   Technical Support

If your Vet/IV 2.2 Infusion Pump is not functioning properly, contact Heska's Technical Support Services at 800.464.3752, option 3. When calling, have the device model and serial number ready.

Pumping Mechanism	Linear peristaltic movement
Flow Rate	Micro—0.1 to 99.9 ml/hr in 0.1 ml increments up to 10 ml/hr. Then, in 1 ml increments up to 99.9 ml/hr. Macro—1 to 999 ml/hr in 1 ml increments up to 100 ml/hr. Then, in 10 ml increments up to 999 ml/hr.
Total Infusible Volume	Micro—0.1 to 2,500 ml Macro—1 to 9,999 ml
Accuracy	± 5%
KVO Rate	0.1 to 5 ml/hr
Air Sensor	Ultrasonic
Maximum Pressure	12 psi
Power Supply	100–240 VAC, 50/60 Hz
Battery	Nickel-Cadmium 7.2V, 1,100 mAh
Battery Operation	Average 6–7 hours at 120 ml/hr
Battery Charging	Automatic when connected to an AC power source (8–10 hours but no longer than 12 hours).
Dimensions	5.4" x 5.4" x 2.8" (W × H × D) 138 mm x 138 mm x 72 mm (W × H × D)
Housing	ABS
Weight	2.6 lbs (1,100 g)