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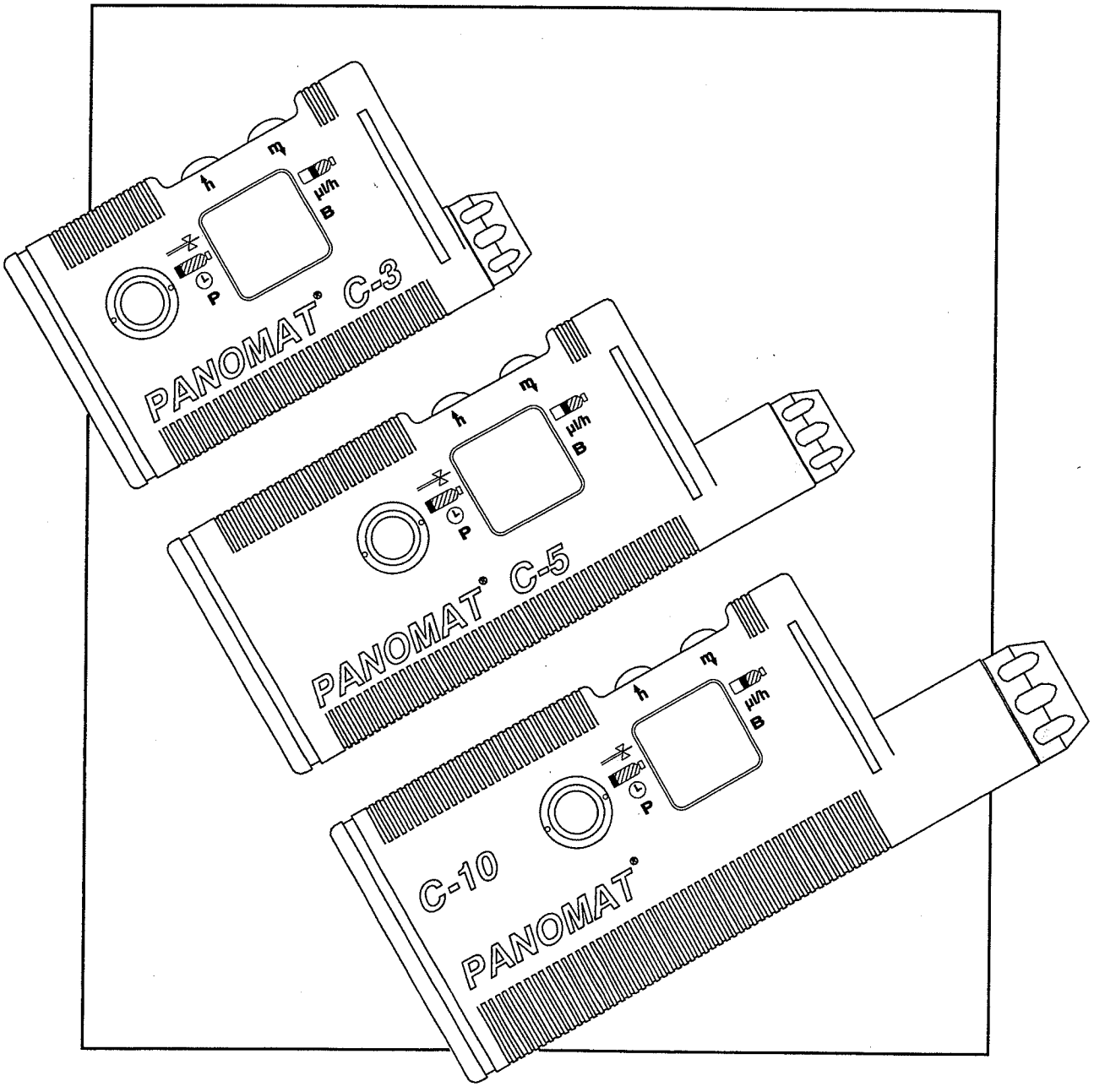
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OPERATING MANUAL

PANOMAT-C SERIES

MICROINFUSION PUMPS



DISETRONIC MINNEAPOLIS, MN 55421

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This manual is ***only*** for the Panomat-C series microfusion pumps:

Panomat C-3,	item number 803.0007
Panomat C-5,	item number 803.0019
Panomat C-10,	item number 803.0031

Technical Assistance

If you have questions concerning the operation of the Panomat-C pump, call Disetronic Technical Services 24 hours a day:

800-688-4578

This manual is intended to be utilized only by clinicians.

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2.0 DESCRIPTION OF THE PANOMAT-C

The PANOMAT-C is a small, ambulatory, battery-operated infusion pump. The PANOMAT-C Infusion System is intended for the controlled delivery of drugs for intravenous or subcutaneous infusion. It is specifically designed for the ambulatory patient. An assortment of carrying cases and accessories is available.

The PANOMAT-C has two delivery options which may be used alone or together for various infusion therapy protocols:

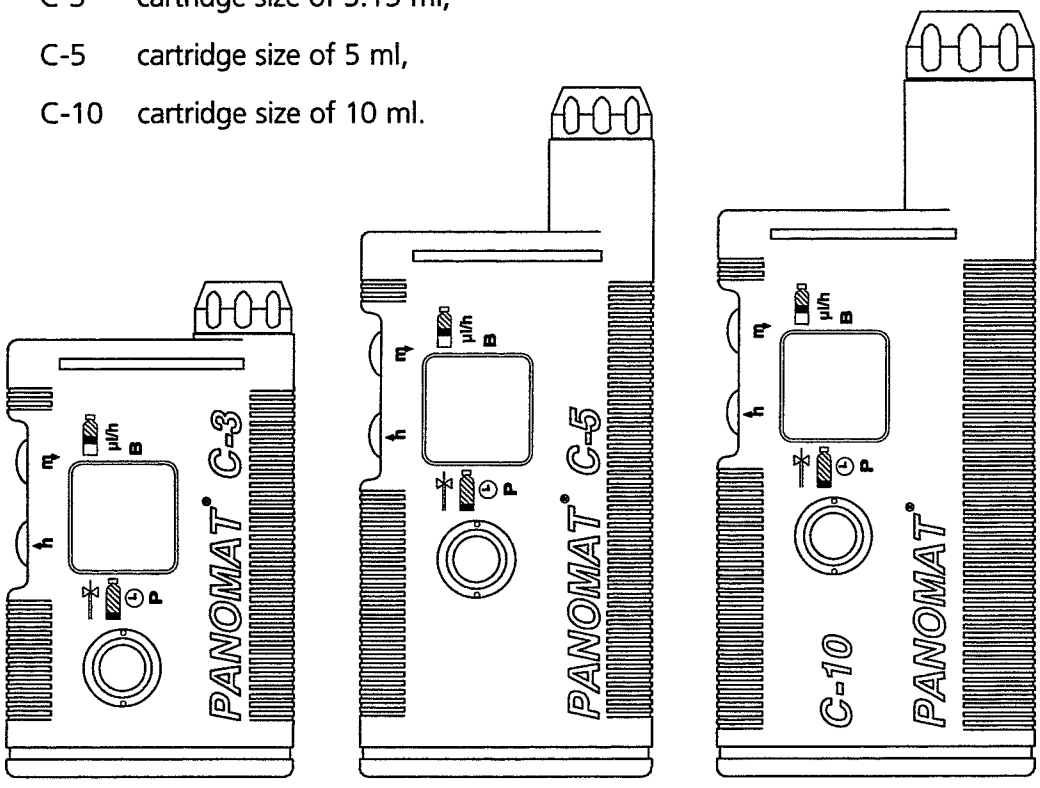
- Rate for continuous infusion.
- Patient demand bolus (B).

Three types of PANOMAT-C infusion pumps are available:

C-3 cartridge size of 3.15 ml,

C-5 cartridge size of 5 ml,

C-10 cartridge size of 10 ml.



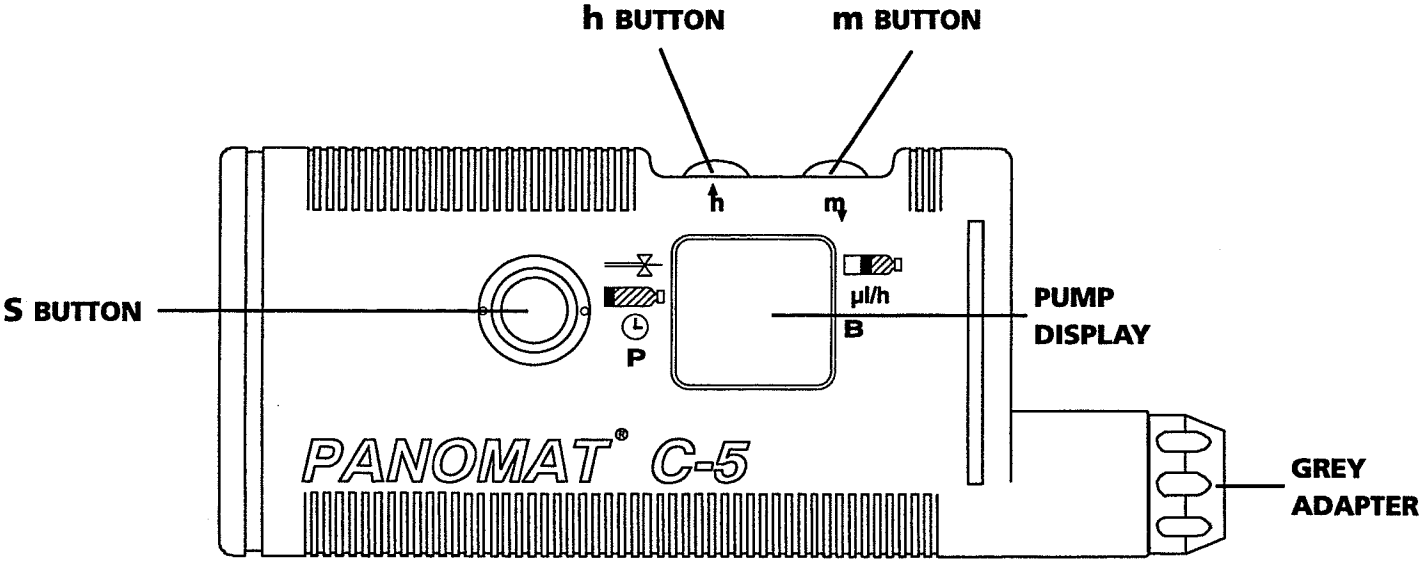
3ml 5ml 10ml

A complete description of the programming limits and factory programmable options of each pump can be found in Technical Data (SECTION 10.4) and Factory Programmable Options (SECTION 10.5).

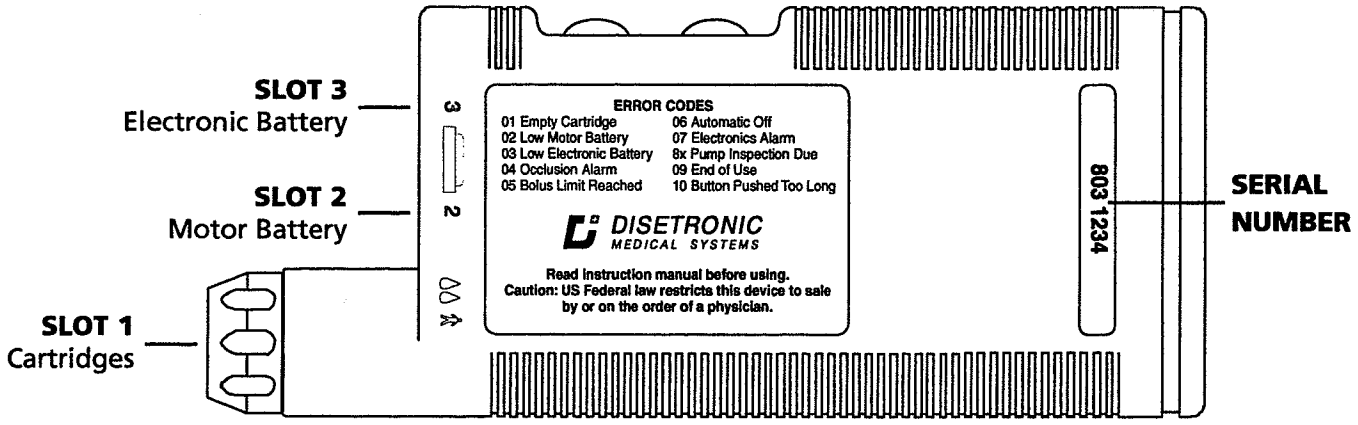
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3.0 SYMBOLS AND BEEPING

3.1 DESCRIPTION OF THE PARTS OF THE PUMP



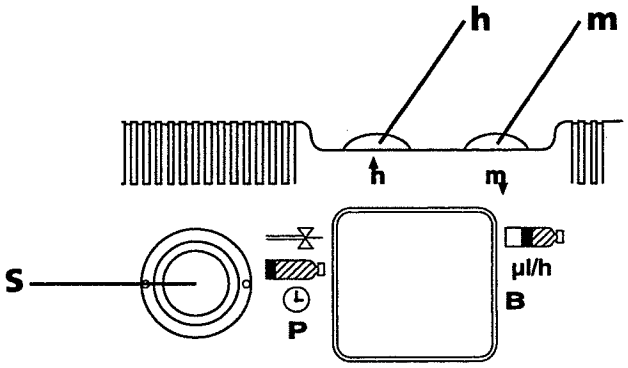
(T-5 Pump Shown.)



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3.2 UNDERSTANDING THE BUTTONS

The pump has three (3) buttons. Two are located on the top side of the pump and marked "h" and "m" One button is located on the front of the pump next to the display, and referred to as the "S" button. Using the "h," "m" and "S" buttons, either individually or in combination makes it possible to perform all of the functions necessary to operate the pump.

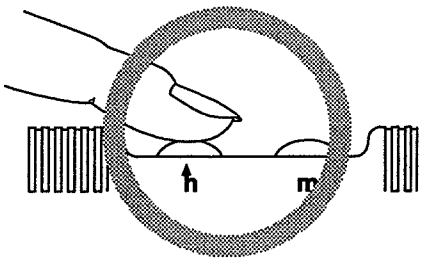


PRESSING THE BUTTONS

The buttons only require a soft push to perform any function. When a button is pushed, there will not be an instant response, but a slight delay of about one-half second before a change on the display or a beep.

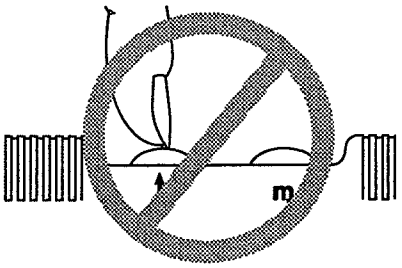
With use, the buttons will soften and become easier to push. The softer buttons are not weaker, just easier to push.

Care should be taken not to puncture the buttons with sharp objects such as pens, pencils, eating utensils or fingernails. Only press the buttons with the pad of the finger.



RIGHT

Press the button with the pad of the finger.

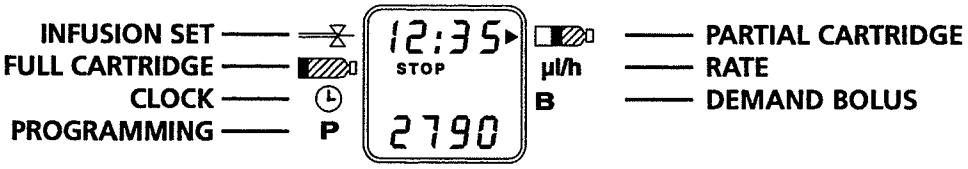


WRONG

Do NOT press the button with the fingernail, the button could be punctured.

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3.3 DESCRIPTION OF SYMBOLS ON THE PUMP PANEL



INFUSION SET
After changing an infusion set, this function primes or fills the new set and needle.

FULL CARTRIDGE
After placing a new filled cartridge into the pump, this function resets the PARTIAL CARTRIDGE display to the volume of drug in the new cartridge. It also resets the total accumulated volume and the total accumulated volume from the demand bolus displays.

CLOCK
Allows the pump clock to be set in military time (24-hour clock).

PROGRAMMING
This function permits: programming of the rate, demand bolus, automatic bolus amount, time of delivery.

PARTIAL CARTRIDGE
The display shows the calculated drug volume in the cartridge.

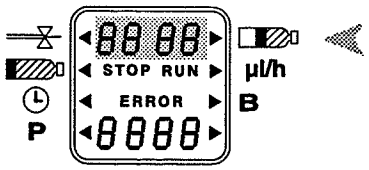
RATE
Continuous infusion programmable in microliters per hour (µl/hr).

DEMAND BOLUS
Patient-activated bolus dose programmable in microliters (µl).

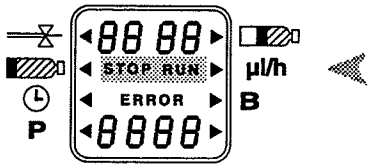
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3.4 UNDERSTANDING THE DISPLAY

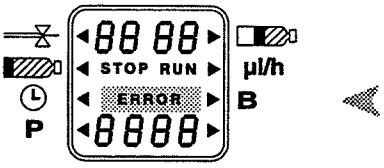
- The upper line of the display, when programmed, will show the current time in military time (24 hour time). (SECTION 4.2)



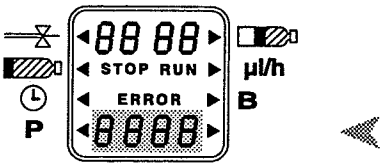
- The second line of the display will show the current status of the pump, either RUN or STOP. (SECTION 6.1)



- The third line of the display will show the word **ERROR** when the pump's microcomputer detects a situation that needs attention by the user. (SECTION 9.1)



- The lower line of the display will show information related to function or status of the pump. (SECTION 7.2)



3.5 BEEPING

Graphic Description of Signal	Duration and Timing of Each Signal	Signal Description
–	Short beep every min.	Pump in STOP.
——– – – –	Long beep, 3 short beeps.	Change to RUN.
– – – ——–	3 short beeps, long beep.	Change to STOP.
———————	Continuous beeping.	ERROR.

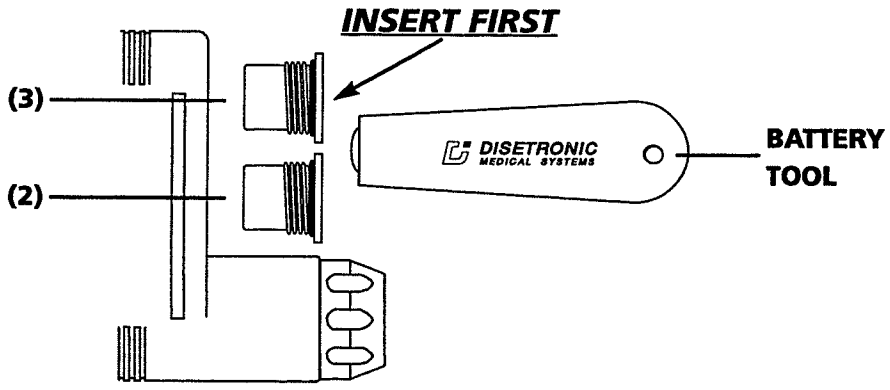
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4.0 PUMP SETUP

4.1 INSERTING BATTERIES

Always insert electronic battery (3) first.

1. Remove protective cover of electronic battery compartment (3) with the battery tool provided. Screw new battery tightly into its compartment.



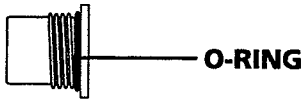
All characters in the display will illuminate.



NOTE: Be sure that batteries are inserted tightly so that they make proper contact. The head of the battery should be just below the surface of the pump housing.

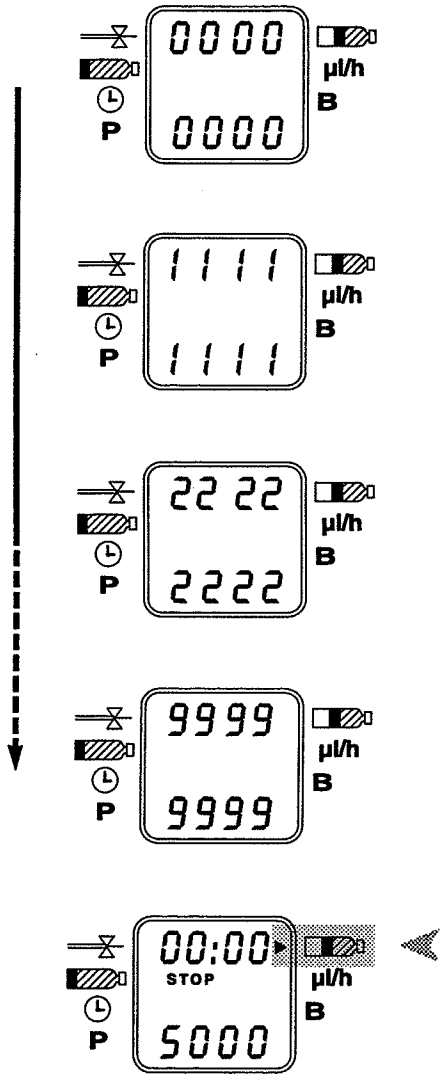
2. Next, screw in the motor battery (2) the same way as the electronic battery.

NOTE: When replacing batteries in the pump, always check to see that a battery has a black O-ring and that it is not frayed or worn. The O-ring seals the battery compartment and prevents moisture from entering the pump.



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3. Press any button to begin resetting the pump, a sequence of numbers from 0 to 9 appear in display, one long beep sounds and STOP appears in the display. (SECTION 6.2 contains detailed information on resetting for a new cartridge. SECTION 6.1 explains starting and stopping the pump.)



(C-5 Pump Panel Shown.)

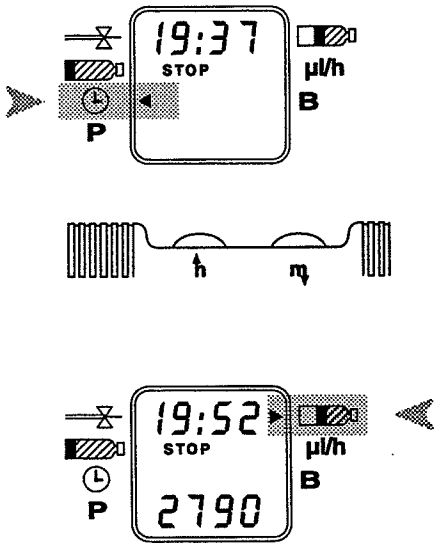
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4.2 SETTING THE CLOCK

The pump displays the time in a 24-hour, or military, format.

NOTE: Pump must be in STOP.

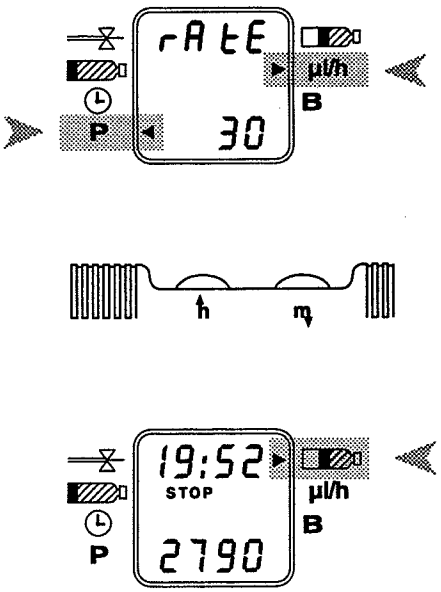
1. Press the "S" button three times, the cursor triangle will be opposite the clock symbol.
2. Each press of the "h" button advances the time display by one hour.
3. Each press of the "m" button advances the time display by one minute.
4. Eight seconds after the last button is pushed, the new time is entered into memory and the pump returns to the PARTIAL CARTRIDGE display and emits a long beep.



4.3 PROGRAMMING RATE (rAtE)

NOTE: Pump must be in STOP.

1. Press the "S" button four times, one cursor triangle will be opposite the P symbol and the other cursor will be opposite the µl/h symbol. rAtE also appears on the display.
2. Each press of the "h" button increases the rate.
3. Each press of the "m" button decreases the rate.
4. Eight seconds after the last button is pushed, the new rate is entered into memory and the pump returns to the PARTIAL CARTRIDGE display and emits a long beep.

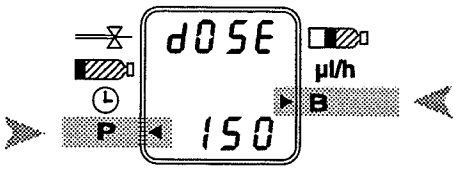


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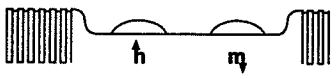
4.4 PROGRAMMING DEMAND BOLUS (B)

NOTE: Pump must be in STOP.

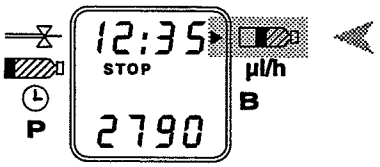
1. Press the "S" button five times, one cursor triangle will be opposite the P symbol and the other cursor will be opposite the D Bolus symbol. dOSE also appears on the display.



2. Each press of the "h" button increases the volume of the demand bolus.
3. Each press of the "m" button decreases the volume of the demand bolus.



4. Eight seconds after the last button is pushed, the new demand bolus amount is entered into memory and the pump returns to the PARTIAL CARTRIDGE display and emits a long beep.



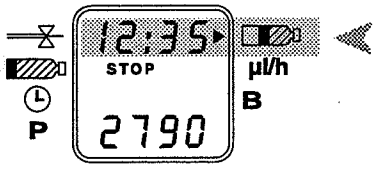
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4.5 VERIFYING PUMP PROGRAMMING

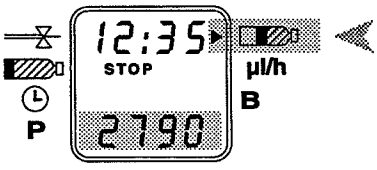
Once the pump has been programmed, it is good policy to verify the program that has been entered into the pump is correct. This program verification should always be done after each programming change.

NOTE: Pump must be in STOP.

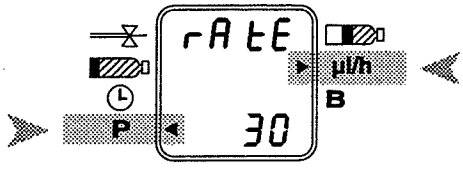
1. Check for the correct time by briefly pressing the "h" or "m" button to illuminate the display (remember the pump is programmed in military or 24-hour time). If the display is illuminated, ignore the button push.



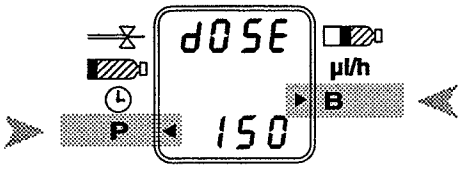
2. Check the volume in the cartridge by referring to the lower part of the display. The triangle cursor will be opposite the partial cartridge symbol. If this is a new filled cartridge, the volume should be close to the capacity of the cartridge in the pump, i.e., 5,000 for a 5-ml cartridge, 9999 for a 10-ml cartridge.



3. Check the rate of infusion by pressing the "S" button four times. The triangle cursors will be opposite the P and µl/h symbols. rAtE will appear on the display.



4. Check the D Bolus volume by pressing the "S" button again briefly. The triangle cursors will be opposite the P and B symbols. dOSE will appear in the display.



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5.0 CARTRIDGE SETUP

If prefilled cartridges are being used proceed to Insertion of Piston Rod Assembly into Plastic Cartridge (Section 5.2) or Insertion of Piston Rod Assembly into Glass Cartridge (Section 5.4).

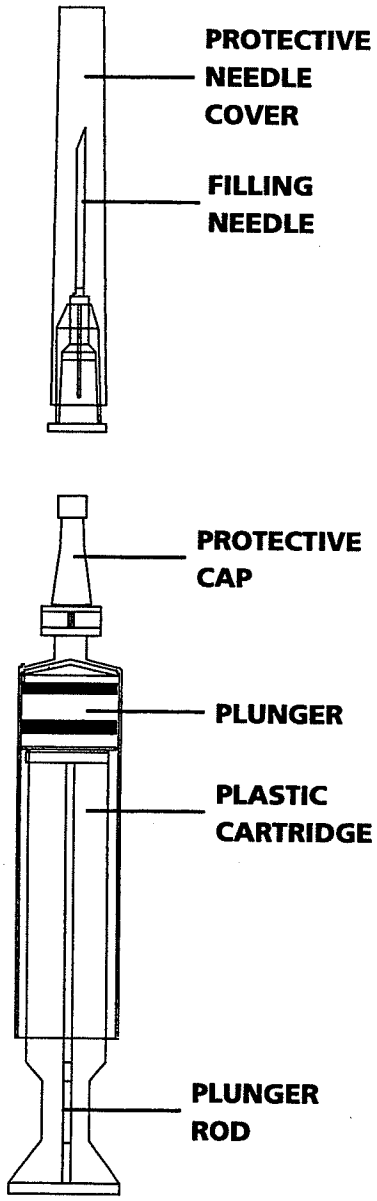
5.1 FILLING A PLASTIC CARTRIDGE

5.1.1 FILLING PLASTIC CARTRIDGE without USING THE FILLING AID

Use of the filling aid is optional.

1. Remove the cartridge and plunger rod from the blister pack.
2. Remove the filling needle from its package.
3. Remove the protective cap from the cartridge.
4. Place filling needle on the cartridge tip, tighten, and remove protective needle cover.
5. Fill cartridge.
6. Remove any air bubbles that may be present by tapping on cartridge or manipulating plunger.
7. Cartridge is filled when top of plunger is even with appropriate volume marking on cartridge.
8. Replace protective needle cover and remove filling needle from cartridge.
9. Recap cartridge with a sterile protective cap making sure the cap snaps tightly into place.
10. Remove plunger rod by turning clockwise, take care not to advance plunger during removal.

Cartridge is now ready for insertion of threaded piston rod.



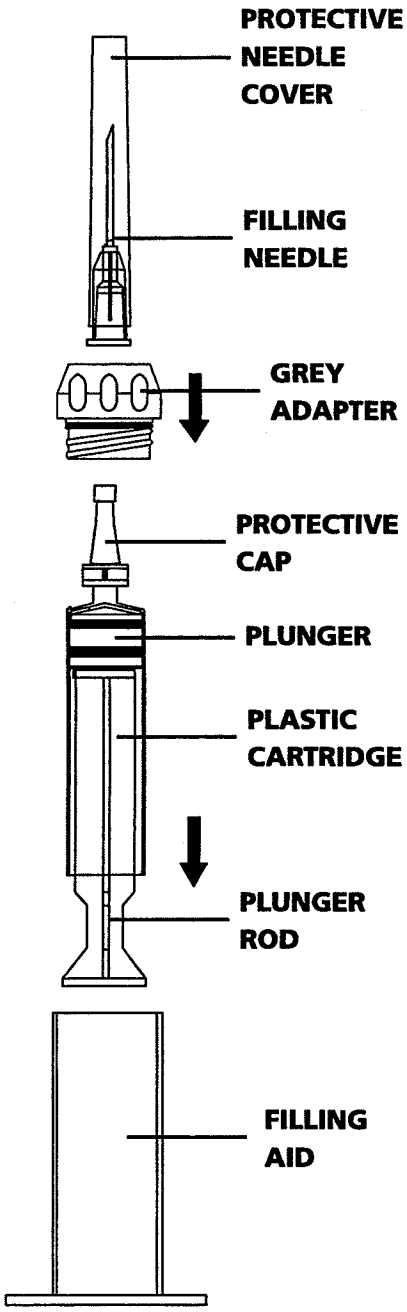
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5.1.2 FILLING PLASTIC CARTRIDGE with THE FILLING AID

Use of the filling aid is optional.

1. Remove the cartridge and plunger rod from the blister pack.
2. Insert the cartridge into the filling aid.
3. Turn the grey adapter clockwise into the cartridge/filling aid.
4. Remove the filling needle from its package.
5. Remove the protective cap from the cartridge.
6. Place the filling needle on the cartridge by turning it clockwise into the grey adapter and remove protective needle cover.
7. Fill cartridge.
8. Remove any air bubbles that may be present by tapping on cartridge or manipulating plunger.
9. Cartridge is filled when top of plunger is even with appropriate volume marking on cartridge.
10. Replace protective cover and remove filling needle from grey adapter.
11. Recap cartridge with a sterile protective cap, make sure that the cap snaps tightly into place.
12. Remove plunger rod by turning clockwise out of the plunger, take care not to advance plunger during removal.
13. Unscrew grey adapter from cartridge filling aid.
14. Remove the filled cartridge from the filling aid.

Cartridge is now ready for insertion of threaded piston rod.



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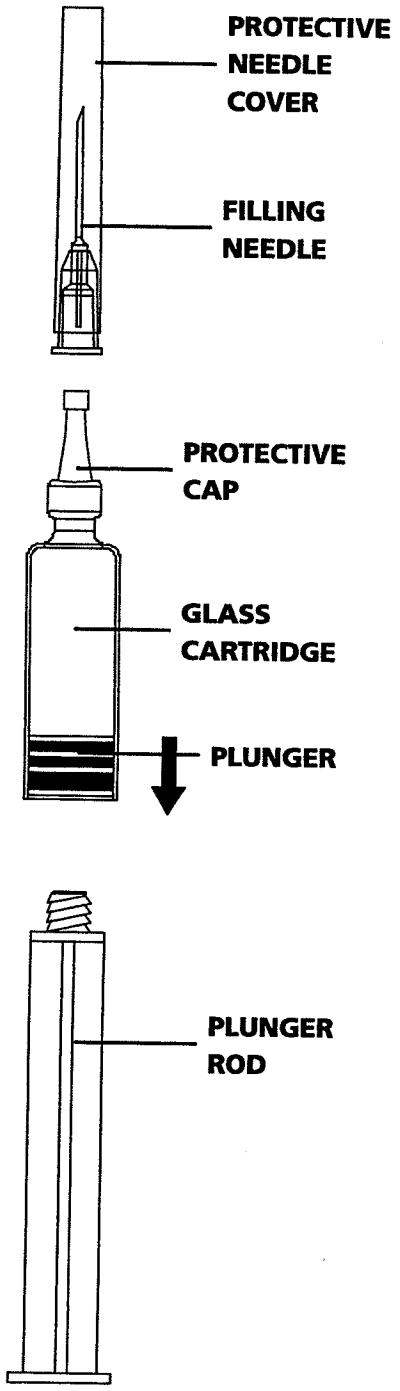
5.2 FILLING GLASS CARTRIDGE

5.2.1 FILLING GLASS CARTRIDGE without USING THE FILLING AID

Use of the filling aid is optional.

1. Remove cartridge, plunger rod and filling needle from blister pack.
2. Turn the plunger rod clockwise into the plunger.
3. Remove the protective cap from the cartridge.
4. Place filling needle on cartridge tip, tighten, and remove protective needle cover.
5. Fill cartridge.
6. Remove any air bubbles that may be present by tapping on cartridge or manipulating plunger.
7. Cartridge is filled when bottom end of plunger is even with the bottom edge of cartridge.
8. Replace protective cover and remove filling needle from cartridge.
9. Recap cartridge with a sterile protective cap.
10. Remove plunger rod by turning counter-clockwise out of the plunger, take care not to advance plunger during removal.

Cartridge is now ready for insertion of the piston rod.



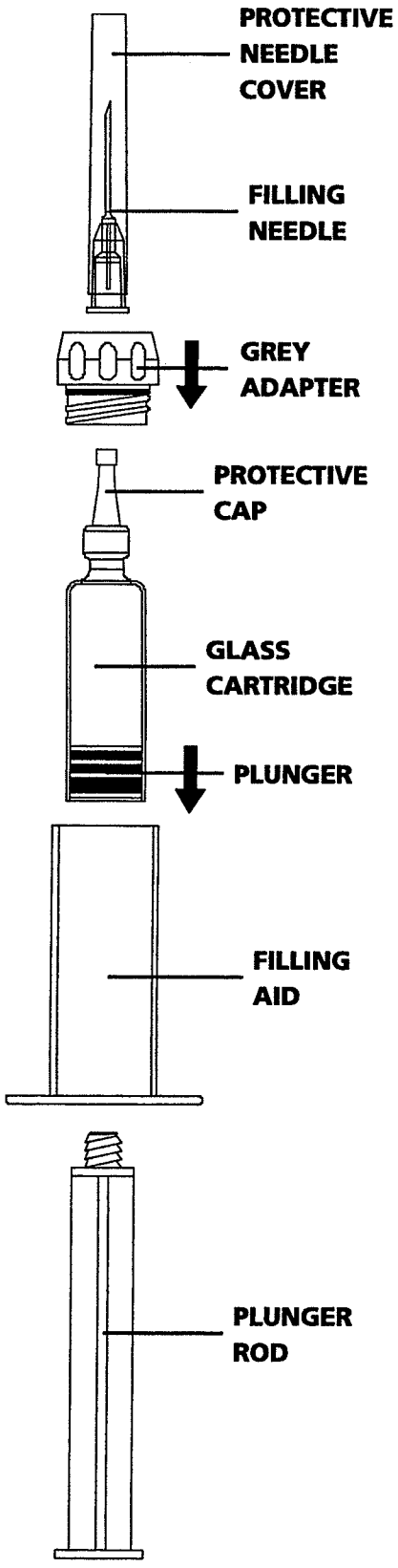
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5.2.2 FILLING GLASS CARTRIDGE with THE FILLING AID

Use of the filling aid is optional.

1. Remove cartridge, plunger rod and filling needle from blister pack.
2. Insert the cartridge into the filling aid.
3. Remove protective cap from cartridge.
4. Turn the grey adapter clockwise onto the cartridge filling aid.
5. Turn the plunger rod clockwise into the plunger.
6. Place the filling needle on the cartridge by turning it clockwise into the grey adapter and remove protective needle cover.
7. Fill cartridge.
8. Remove any air bubbles that may be present by tapping on cartridge or manipulating plunger.
9. Cartridge is filled when bottom end of plunger is even with the bottom edge of cartridge.
10. Replace protective cover and remove filling needle from grey adapter.
11. Recap cartridge with a sterile protective cap.
12. Remove plunger rod by turning counter-clockwise out of the plunger, take care not to advance plunger during removal.
13. Unscrew grey adapter from cartridge filling aid and separate from cartridge.
14. Remove the filled cartridge from the filling aid.

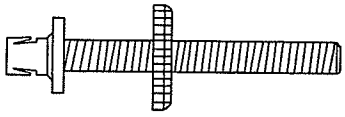
Cartridge is now ready for insertion of the piston rod.



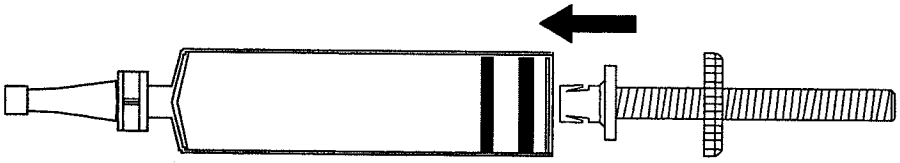
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5.3 ATTACHING THE PISTON ROD ASSEMBLY TO GLASS OR PLASTIC CARTRIDGE

NOTE: Check to make sure that the cog wheel spins freely, if there is any binding clean or replace the piston rod assembly.



Insert the nylon cap into the recess in the syringe plunger. Make sure that it snaps completely into place. DO NOT TWIST OR TRY TO TIGHTEN.



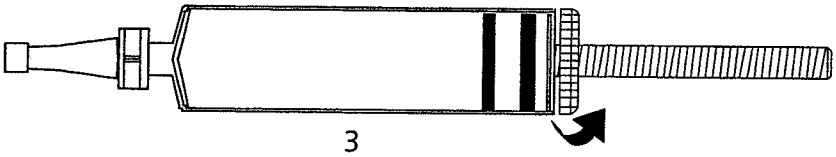
Spin the cog wheel until it reaches the cartridge body, then turn cog wheel back 1/8 turn to loosen slightly.



1



2

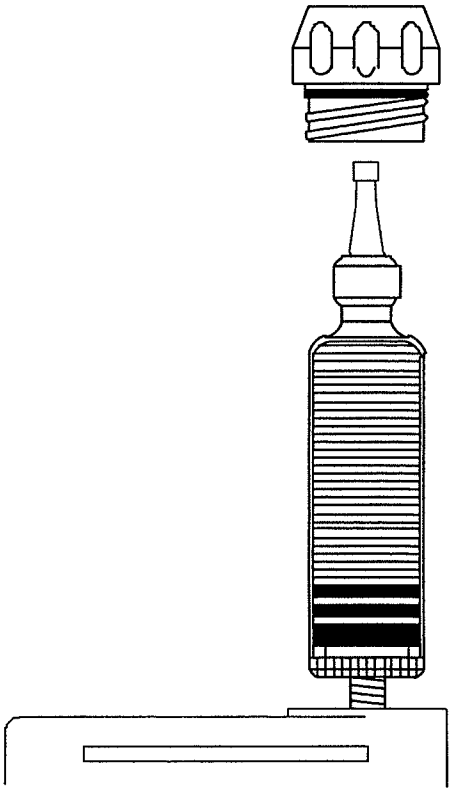


3

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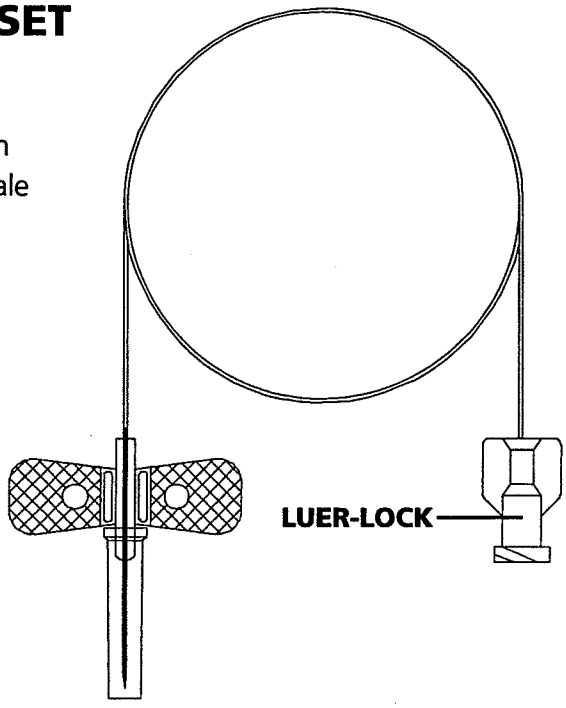
5.4 INSERTING CARTRIDGE/PISTON ROD INTO THE PUMP

1. Set the pump on its end onto a flat surface or hold it vertically.
2. Insert the cartridge (either plastic or glass), with piston rod attached, into the cartridge compartment, if necessary, rotate the cartridge slowly until it and the piston rod fall into place.
3. Turn the grey adapter clockwise onto the cartridge compartment.
4. Remove the protective cap and attach the infusion set.



5.5 ATTACHING INFUSION SET

The cartridge has now been secured in the pump and the infusion or extension set can be added. Simply turn the female luer-lock of the infusion set clockwise into the threads of the grey adapter. Always confirm that the connection is tight, but do not over tighten. Over tightening may cause the luer-lock to crack.



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6.0 OPERATING THE PUMP

6.1 STARTING AND STOPPING THE PUMP

When the pump is in STOP, drug is not delivered, but the pump may be programmed. When the pump is in RUN drug is delivered by the preprogrammed protocol and demand boluses may be given.

- To determine if the pump is in the STOP or RUN mode press either the "h" or "m" button. The display will indicate either STOP or RUN.



- To change from STOP to RUN:
  Press the "h" and "m" buttons simultaneously and HOLD for a minimum of 3 seconds. The pump sounds one long beep when the buttons are pressed and then three short beeps when RUN appears in the display.



- To change from RUN to STOP:
  Press the "h" and "m" buttons simultaneously and HOLD for a minimum of 3 seconds. The pump sounds three short beeps when the buttons are pressed and one long beep when STOP appears in the display.



NOTE: When the pump is in STOP, the pump will emit a short beep every minute to remind the user that the pump is stopped and no drug is being delivered. This beeping can be silenced. (SECTION 7.3)

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6.2 RESETTING FOR A NEW CARTRIDGE

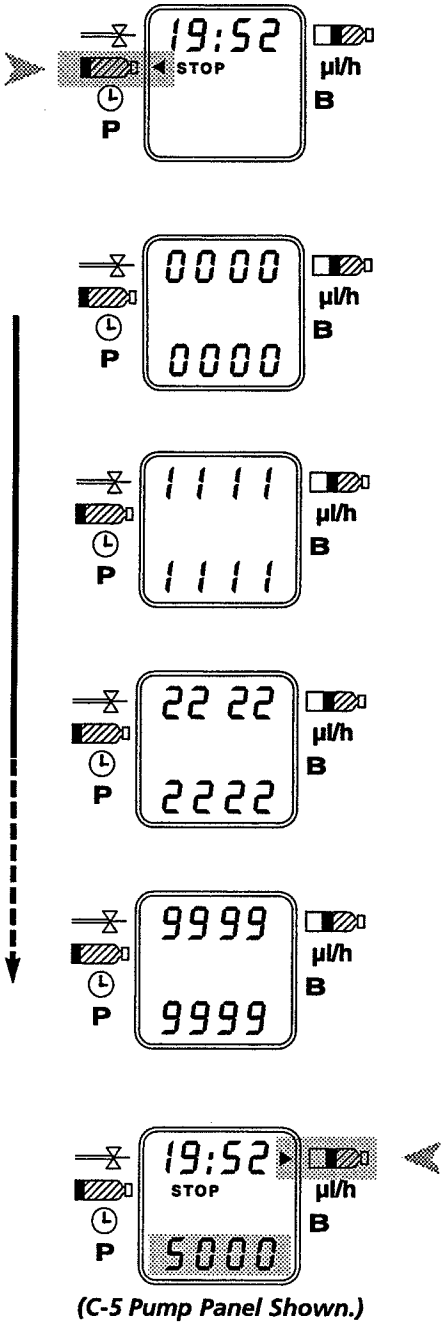
The electronics of the pump must be informed when a new cartridge is placed in the pump. When the pump is reset for a new cartridge, information displays are also reset.

NOTE: When both batteries are removed from the pump or a new cartridge is installed in the pump and the pump is reset, information displays are also reset.

NOTE: Pump must be in STOP.

1. Press the "S" button twice, the cursor triangle will be opposite the full cartridge symbol.

2. Press the "h" and "m" buttons simultaneously and release, the numbers from 0 to 9 roll through the display, one long beep sounds and the new reset volume appears in the display.



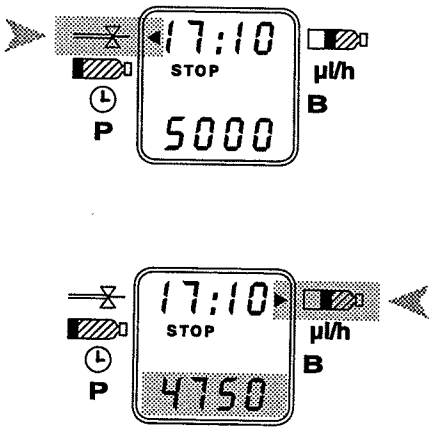
(C-5 Pump Panel Shown.)

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6.3 PRIMING

NOTE: Pump must be in stop.

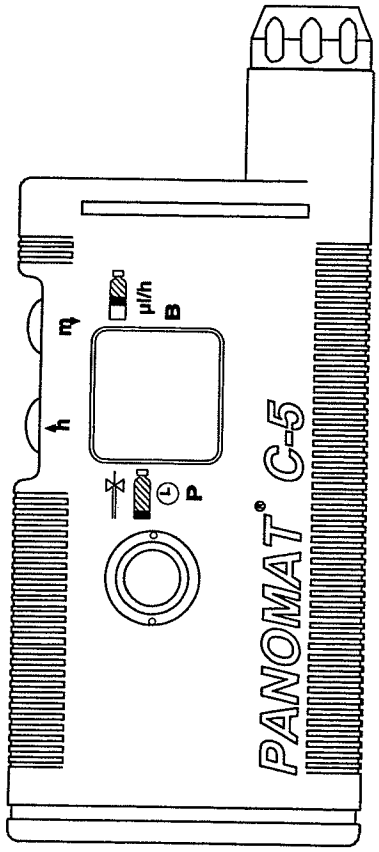
1. Press the "S" button one time, the cursor triangle will be opposite the infusion set symbol.
2. Press the "h", "m" and "S" buttons simultaneously and then release. The pump emits a short beep and priming begins. The cartridge volume on the lower line of the display decreases as the priming continues. When priming is finished, the pump emits a beep and returns to the PARTIAL CARTRIDGE display.



NOTE: To stop the prime function press any button ("h", "m" or "S").

NOTE: An infusion set is primed when all air is eliminated from the set and drug appears at the end of the set.

NOTE: During priming, make sure the pump is held vertically to ensure all air is eliminated. Don't begin priming until all air has been moved to the top of the cartridge (nipple end). Gently tapping the cartridge is usually effective in moving small air bubbles to the cartridge nipple where they can be eliminated by priming.



PUMP IN VERTICAL POSITION
(C-5 Pump Shown.)

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6.4 CHANGING THE CARTRIDGE AND THE SET (USING A FILLED CARTRIDGE)

NOTE: If during use the calculated volume in the pump cartridge becomes 0, the pump will alarm. ERROR 01 and STOP will appear in the display.

NOTE: Pump must be in STOP.

1. Wash hands.
2. Remove protective cap, then eliminate any trapped air from new new filled cartridge and replace protective cap.
3. Remove plunger rod from new filled cartridge and discard.
4. Remove old infusion set from the patient using proper technique.
5. Unscrew grey adapter and remove old cartridge and piston rod from pump.
6. Remove piston rod from old cartridge and set aside.
7. Discard old cartridge and old infusion set in an appropriate manner.
8. Insert piston rod into the plunger of the new filled cartridge. (SECTION 5.2)
9. Place the cartridge/piston rod assembly into the pump. (SECTION 5.3)
10. Screw the grey adapter tight. (SECTION 5.3)
11. Remove the protective cap.
12. Attach the luer-lock of the new set tightly to the grey adapter.
13. Reset for a new cartridge. (SECTION 6.2)
14. Prime the set, holding the pump vertically, until a drop of fluid appears at the end of the set. (SECTION 6.3)
15. Insert the infusion set or attach the extension set to the appropriate access device.
16. If appropriate, place the pump in run. (SECTION 6.1)

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6.5 CHANGING THE CARTRIDGE ONLY (USING A FILLED CARTRIDGE)

NOTE: If during use the calculated volume in the pump cartridge becomes 0, the pump will alarm. ERROR 01 and STOP will appear in the display.

NOTE: Pump must be in STOP.

1. Wash hands.
2. Remove protective cap, then eliminate any trapped air from new new filled cartridge and replace protective cap.
3. Remove plunger rod from new filled cartridge and discard.
4. Close the tubing using the slide clamp (SECTION 6.6)
5. Unscrew the grey adapter and remove the old cartridge and the piston rod from pump.
6. Remove piston rod from old cartridge.
7. Discard the old cartridge in an appropriate manner.
8. Insert piston rod into the plunger of the new filled cartridge (SECTION 5.2)
9. Place the cartridge/piston rod assembly into the pump. (SECTION 5.3)
10. Screw the grey adapter tight. (SECTION 5.3)
11. Reset for a new cartridge. (SECTION 6.2)
12. Remove the protective cap.
13. Prime the pump, holding it vertically, until a drop appears at the cartridge tip. (SECTION 6.3)
14. Using the prime function, fill the hub of the female luer-lock connector of the set. (The slide clamp still in place.)
15. Attach the already primed set.
16. Remove the slide clamp.
17. If appropriate, place the pump in run. (SECTION 6.1)

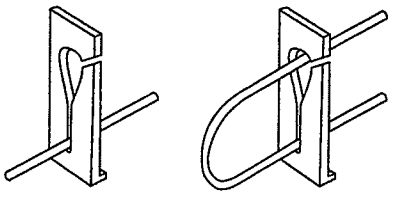
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6.6 CHANGING THE SET ONLY

1. Wash hands.
2. Remove the old set from the grey adapter discard in an appropriate manner.
3. Attach the luer-lock of the new set tightly to the grey adapter.
4. Prime the set, holding the pump vertically, until a drop of fluid appears at the end of the set. (SECTION 6.3)
5. Insert the infusion set or attach the extension set to the appropriate access device.
6. If appropriate, place the pump in run. (SECTION 6.1)

6.7 USING THE SLIDE CLAMP

At times it is necessary to disconnect a set from the pump while the set remains attached to the infusion site. A slide clamp is needed to prevent accidental administration of drug or air.



To use the slide clamp, slide the tubing into the narrow end of the slit opening in the clamp. If the slide clamp is not on the tubing, double the tubing and thread it through the opening in the clamp, then slide the tubing into the narrow end of the slit opening.

The slide clamp may be left on the tubing or it may be carried separately.

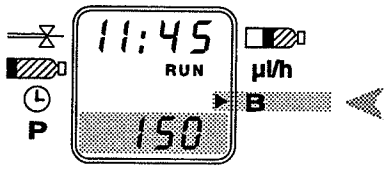
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7.0 SPECIAL FUNCTIONS

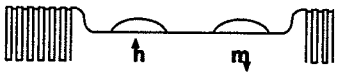
7.1 DELIVERING A DEMAND BOLUS (B)

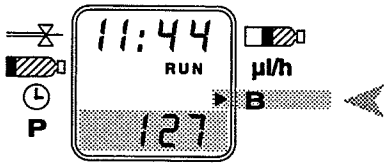
NOTE: Pump must be in RUN.

- Press either the "h" or "m" button, three short beeps sound, triangle cursor moves to B symbol, and the volume of the demand bolus appears in the lower line of the display.



- To initiate delivery, if the "h" button was pressed first then press the "m" button, if the "m" button was pressed first then press the "h" button. The programmed demand bolus dose B will be delivered immediately. The demand bolus shown in the lower line of the display will be decreasing during delivery.





NOTE: To stop delivery of the demand bolus, press the "h" and "m" buttons simultaneously and HOLD for a minimum of 3 seconds. The pump switches to the STOP mode and the bolus stops.

NOTE: If a bolus is being delivered and it is interrupted by stopping the pump, the bolus will end. Bolus delivery will not be resumed where it stopped by restarting the pump or the bolus.

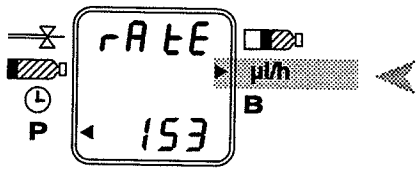
NOTE: If the "S" button is pressed while delivering a demand bolus, InFo appears on the display and a triangle cursor appears opposite the µl/h, and B symbols. The total accumulated volume shown in the last line of the display will increase during delivery.

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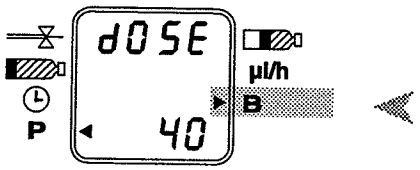
7.2 INFORMATION RECALL

NOTE: Pump must be in RUN.

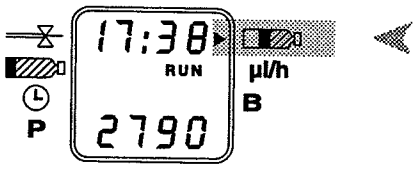
- Press the "S" button once, a short beep sounds, triangle cursors moves to µl/h, symbol. The last line of the display indicates the total volume delivered by rate since the pump was last reset.



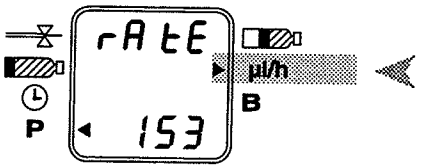
- Press the "S" button again, a short beep sounds, the triangle cursor moves to B symbol. The last line of the display indicates the total demand bolus B amount delivered since the last time the pump was reset.



- Press the "S" button again, a short beep sounds, triangle cursor moves to the partial cartridge symbol. The last line of the display indicates the volume remaining in the cartridge.



- Pressing the "S" button again returns the pump to the volume delivered by rate display as in step 1 above.



NOTE: The volume remaining in the cartridge is displayed when the pump is in the RUN mode 8 seconds after the last button push.

NOTE: When both batteries are removed from the pump or a new cartridge is placed in the pump and the pump is reset, information displays are also reset.

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7.3 SILENCING BEEPING

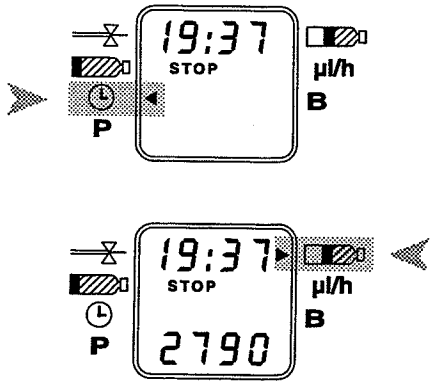
Certain acoustic signals (beeping) can be silenced.

Tones silenced	Tones audible
STOP/RUN or RUN/STOP	All ERROR codes
Pump in STOP	Low battery
Low cartridge volume	Dead battery
BOLUS confirmation	Empty cartridge
Button pushed	

To silence certain acoustic signals (beeping) as in the above table:

NOTE: Pump must be in STOP.

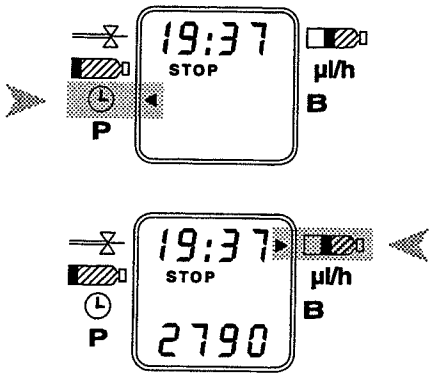
- Press the "S" button three times, the cursor triangle will be opposite the clock symbol.
- Press and hold the "h" and "m" buttons simultaneously for 3 seconds. The pump beeps once when the buttons are pressed, then returns to the partial cartridge display after eight seconds. The acoustic signals are now silenced as in the table above.



To resume operation of all acoustic signals (beeping):

NOTE: Pump must be in STOP.

- Press the "S" button three times, the cursor triangle will be opposite the clock symbol.
- Press and hold the "h" and "m" buttons simultaneously for 3 seconds. (Notice that the pump does not beep.) After 8 seconds the pump returns to the partial cartridge display and beeps indicating that the acoustic signals are restored.



NOTE: The acoustic signals are reactivated if both batteries are removed at the same time.

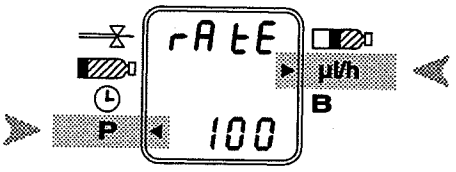
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7.4 PROGRAM LOCK

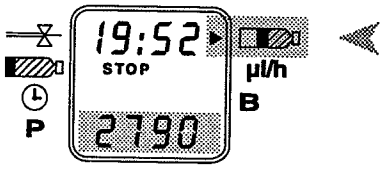
If desired, it is possible to lock the rate, bolus and A Bolus programming. A user will still be able to deliver a programmed bolus.

NOTE: Pump must be in STOP.

- Press the "S" button four times, the cursor triangles will be opposite the P and the µl/h symbols.



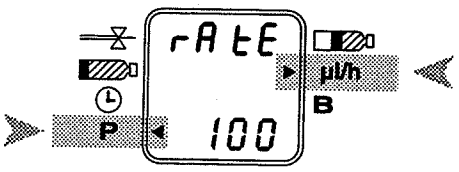
- Press and hold the "h", "m" and "S" buttons simultaneously for 3 seconds. The pump then returns to the PARTIAL CARTRIDGE display after eight seconds. The programmed values are now locked.



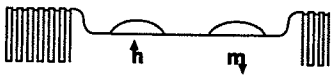
NOTE: To unlock the programmed values, repeat the same procedure for locking the programmed values.

To confirm that the program is locked:

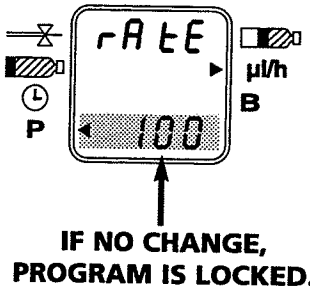
- Press the "S" button four times. The cursor triangle will be opposite the P and µl/h symbols.



- Press the "h" or "m" button.



- The lower display will not change if the program is locked. If the lower display changes, the program is not locked. IF THE LOWER DISPLAY DOES NOT CHANGE, THE PROGRAM IS LOCKED.



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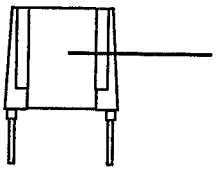
7.5 WATERPROOFING THE PUMP

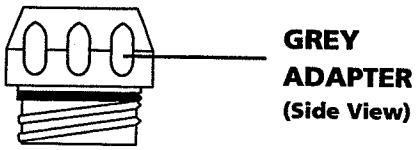
The pump can be made waterproof. Before entering a shower, bathing, or swimming the user should do a general check of the pump to ensure there are no small cracks in the pump case, display window or buttons. If any cracks are apparent, the pump should not be used in water and should be returned to Disetronic for service.

To waterproof the pump, the user should:

1. Make sure batteries are tightly screwed into the pump.
2. Make sure the grey adapter is tight.
3. Snap the red tappet into the grey adapter. This is done by placing the two legs of the red tappet into the two holes in the grey cartridge adapter and pressing firmly until it snaps in place.

   The two holes in the cartridge adapter are used to overcome altitude and pressure changes such as found during plane trips. The red tappet should not be used except before going into water. If one or both legs of the red tappet break off or become lodged in the grey adapter, both grey adapter and red tappet must be replaced.







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8.0 SPECIAL SITUATIONS

8.1 IF RECORDKEEPING FUNCTIONS ARE RESET

Recordkeeping functions are reset to 0 if the pump is reset for a new cartridge. (SECTION 6.2) If resetting is done with a partial cartridge in place, the calculated volume is reset to show the full cartridge volume. The calculated low volume warning beeps will not provide an alert to the low volume remaining in the cartridge, nor will the volume remaining in the cartridge be accurate. When the plunger reaches the bottom of the cartridge, the 04 occlusion alarm will be activated and this signal will indicate that the cartridge is empty.

8.2 IF BOTH BATTERIES ARE REMOVED

It is best to only remove one battery at a time when batteries require changing. The recordkeeping functions and the clock time will be retained, if only one battery is changed at a time.

In the event that both batteries are removed from the pump, when the batteries are replaced, the pump will reset (SECTION 4.1), recordkeeping functions will be reset to 0 and the clock will be reset to 00:00. The correct time should be reprogrammed. If both batteries are removed with a partial cartridge in place, the calculated volume is reset to show the full cartridge volume. The calculated low volume warning beeps will not provide an alert to the low volume remaining in the cartridge, nor will the volume remaining in the cartridge be accurate. When the plunger reaches the bottom of the cartridge, the 04 occlusion alarm will be activated and this signal will indicate that the cartridge is empty.

8.3 IF A PARTIALLY FILLED CARTRIDGE IS USED

If a partially filled cartridge is placed in the pump and the pump is reset (SECTION 6.2) the calculated volume is reset to show a full cartridge. The calculated low volume warning beeps will not provide an alert to the low volume remaining in the cartridge, nor will the volume remaining in the cartridge be accurate. When the plunger reaches the bottom of the cartridge, the 04 occlusion alarm will be activated and this signal will indicate that the cartridge is empty.

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9.0 TROUBLESHOOTING

9.1 ERROR MESSAGES

The dual microprocessor system registers and alerts the user immediately to error messages concerning the pump.

If an error code appears in the display:

- The pump stops.
- STOP, ERROR, and a two-digit error code appear in the display.
- The pump beeps every second.

The beeping can be canceled by pressing either the "h", "m" or "S" button for 3 seconds to acknowledge the error message. To clear the error message in the display, follow the instructions for that specific error message.

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ERROR 01: EMPTY CARTRIDGE



The pump beeps when the calculated volume in the cartridge is low or empty.

T-3

20 µl remaining	1 short beep
15 µl remaining	2 short beeps
10 µl remaining	3 short beep
5 µl remaining	4 short beeps
0 µl remaining	1 beep per second and empty cartridge alarm ERROR 01

T-5

400 µl remaining	1 short beep
300 µl remaining	2 short beeps
200 µl remaining	3 short beeps
100 µl remaining	4 short beeps
0 µl remaining	1 beep per second and empty cartridge alarm ERROR 01

T-10

1000 µl remaining	1 short beep
750 µl remaining	2 short beeps
500 µl remaining	3 short beeps
250 µl remaining	4 short beeps
0 µl remaining	1 beep per second and empty cartridge alarm ERROR 01

When the volume is low, the beeps act as a low-volume reminder. The cartridge should be changed soon.

NOTE: The low-volume warning beeps will not sound if the acoustic signals have been silenced. (SECTION 7.3)

When no calculated volume is remaining, the pump alarms ERROR 01 and STOP appear in the display. The cartridge must be changed now.

TO CONTINUE OPERATION OF THE PUMP:

1. The audible portion of the alarm may be silenced by pressing and holding the "h", "m" or "S" button for 3 seconds.
2. A new cartridge should be filled and inserted into the pump. (SECTION 5)
3. The pump should be reset for the new cartridge. (SECTION 6.2)
4. The priming function should be used to eliminate slack in the system. (SECTION 6.3)
5. The infusion set can then be re-connected or a new set may be attached and primed.
6. If appropriate, the pump may be placed in run to continue operation.

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ERROR 02: LOW MOTOR BATTERY

The pump checks the voltage of the motor battery every hour and every time the pump is switched from STOP to RUN. When the voltage reaches a low level, the pump beeps. ERROR 02 appears in the display.



TO CONTINUE OPERATION OF THE PUMP:

1. The audible portion of the alarm may be silenced by pressing and holding the "h", "m" or "S" button for 3 seconds.
2. Change the motor battery (#2 battery compartment).
3. The visual portion of the alarm ERROR 02 may be eliminated by pressing the "h", "m" or "S" button again.

NOTE: It may be possible to operate the pump for a short period of time (1 to 12 hours) with even an extremely weak battery. The "S" button should be pressed twice as described above in steps 1 and 3, but without changing the motor battery.

ERROR 03: LOW ELECTRONIC BATTERY

The pump checks the voltage of the electronic battery every hour and every time the pump is switched from STOP to RUN. When the voltage reaches a low level, the pump beeps. ERROR 03 appears in the display.



To continue operation of the pump:

1. The audible portion of the alarm may be silenced by pressing and holding the "h", "m" or "S" button for 3 seconds.
2. Change the electronic battery (#3 battery compartment).
3. The visual portion of the alarm ERROR 03 may be eliminated by pressing the "h", "m" or "S" button again.

NOTE: It may be possible to operate the pump for a short period of time (1 to 12 hours). The "S" button should be pressed twice as described above in steps 1 and 3, but without changing the electronic battery.

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ERROR 04: OCCLUSION ALARM

CAUSES:

- Blocked needle.
- Clamped or kinked tubing.
- Cartridge has been reused.
- Dirty or broken threaded piston rod.
- Dislodged top hat from threaded piston rod. (Glass cartridge only.)



When the occlusion alarm is activated, the pump beeps. ERROR 04 and STOP appear in the display.

To continue operation of the pump:

1. The audible portion of the alarm may be silenced by pressing and holding the "h", "m" or "S" button for 3 seconds.
2. Change the needle and infusion set.
3. If using a glass cartridge, check to see that the nylon end cap is in place on the threaded piston rod.
4. Place the pump in the RUN mode, to continue operation of the pump and clear the error message from the display.

NOTE: If ERROR 04 is activated again shortly, the problem is usually with the cartridge and it should be changed as well.

If problems continue contact Disetronic Technical Services at 800-688-4578.

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ERROR 05: BOLUS LIMIT REACHED

This alarm is not used by the Panomat-C Series.

ERROR 06: AUTOMATIC OFF

This is a programmable limit that must be ordered by a physician. Upon request Disetronic can program the pump to automatically change to the STOP mode if the "h", "m" or "S" button has not been pressed within the programmed number of hours (1-24). If no button is pressed within the programmed time, the pump beeps. ERROR 06 and STOP appear in the display.



To continue operation of the pump:

1. The audible portion of the alarm may be silenced by pressing and holding the "h", "m" or "S" button for 3 seconds.
2. Place the pump in RUN to continue operation of the pump and clear the error message from the display.

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ERROR 07: ELECTRONICS ALARM

The dual microprocessor system constantly surveys the pump's electronics. When a problem is sensed, the pump beeps. ERROR 07 and STOP appear in the display. If there is a deficiency in only the visual display, just intermittent beeps will be heard. If a pump does not have a functioning visual display it should be removed from service and returned to Disetronic for repair.



To troubleshoot the electronics alarm and resume pump operation:

1. Clamp the tubing using the slide clamp.
2. Remove both batteries from the pump.

NOTE: Removing both batteries will clear and reset the total volume delivered, total demand boluses delivered, and the volume remaining information. (SECTION 8.2)

3. Insert a battery into #3 battery compartment (electronic battery). DO NOT insert a battery in #2 battery compartment (motor battery). Leave it empty.
4. Reset the pump (press any button). The numbers from 0 to 9 appear in the display followed by ERROR 02 and beeping.
5. Silence the 02 alarm by pressing the "S" button.
6. Insert a battery in the #2 battery compartment.
7. Prime without a cartridge in the pump to check on motor operation. If the pump primes without ERROR 07 go to step 9. If the pump alarms ERROR 07 again, take the pump out of service.
8. Set the clock.
9. Check the programmed values (rAtE, D Bolus, A Bolus).
10. Place the pump in RUN to continue operation of the pump.
11. If the pump does not alarm again during this procedure, ERROR 07 has been cleared.
12. Uncap the infusion set and reconnect the pump. Remove the tubing clamp.
13. If appropriate, the pump may be placed in RUN to continue operation.

NOTE: If ERROR 07 reappears during this procedure, take the pump out of service. If additional assistance is required, call Disetronic Technical Services at 800-688-4578.

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ERROR 8X: PUMP INSPECTION DUE

A Free Technical Safety Inspection (TSI) is required on each Panomat-C every 30 months. The 30 months are calculated on the actual run time of the device (time when the pump is in RUN.). To allow time to exchange devices that are on patients, the pump has an end of use warning. When the end of use warning occurs, the pump beeps. ERROR and 88, 86, 84 or 82 appear in the display. The pump will stay in RUN during these error messages.

ERROR 88	8 weeks before Free TSI due
ERROR 86	6 weeks before Free TSI due
ERROR 84	4 weeks before Free TSI due
ERROR 82	2 weeks before Free TSI due



To continue operation of the pump:

1. The audible portion of the alarm may be silenced by pressing and holding the "h", "m" or "S" button for 3 seconds.
2. The visual portion of the alarm ERROR may be cleared by pressing the "h", "m" or "S" button again.

Send the pump to Disetronic at any time during ERROR 8X alarms for the Free TSI. Remember to include a note indicating that the free TSI is needed along with name, address and a day-time phone number. Make sure "Free TSI" is on the outside of the package for faster handling. It is best to send the pump by a carrier that tracks the shipment. Some examples of tracked shipments are: Registered Mail, Certified Mail, Express Mail, UPS Ground Trac and Federal Express 2-day Economy.

If the pump passes the safety inspection, an additional 30 months of run time will be placed into the pump. The pump will be returned via a tracked shipment. If the pump does not pass you will be notified by phone or letter.

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ERROR 09: END OF USE

After 30 months of run time, the pump beeps. ERROR 09 and STOP appear in the display. The pump should be taken out of service and returned to Disetronic for a Free Technical Safety Inspection as described under ERROR 8X.



The pump may still be operated for a very short period of time (hour to hour).

To continue operation of the pump for one hour:

1. The audible portion of the alarm may be silenced by pressing and holding the "h", "m" or "S" button for 3 seconds.
2. Place the pump in the RUN mode, to continue operation of the pump for one hour and clear the error message from the display.

NOTE: After one hour of run time, ERROR 09 will appear again.

ERROR 10: BUTTON PUSHED TOO LONG

If one of the buttons is held down too long (>16 seconds), the pump beeps. ERROR 10 and STOP appear in the display.



To continue operation of the pump:

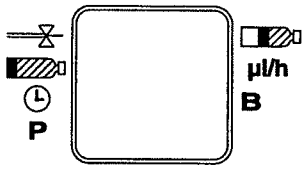
1. The audible portion of the alarm may be silenced by pressing and holding the "h", "m" or "S" button for 3 seconds.
2. The visual portion of the alarm ERROR 10 may be cleared by again pressing the "h", "m" or "S" button.

If the pump was in RUN, place it back in RUN to continue operation.

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9.2 BLANK DISPLAY

When the pump is in RUN or STOP after 30 seconds the display will go blank to save battery power. The display may be illuminated again by pressing any button. In the event that the display cannot be illuminated, the pump should be removed from service.



9.3 FULL SEGMENT DISPLAY

After inserting the batteries, the full segment dislay will be illuminated. By pressing any button, the pump will begin the reset procedure (SECTION 4.1).



1. If the pump cannot be reset and the pump continues to show the full segment display, completely remove both batteries (no batteries should be in the pump). Reinsert both batteries.
2. If the pump cannot be reset and the pump still continues to show the full segment display, replace the #3 battery with a fresh battery.
3. If the pump still cannot be reset, the pump should be removed from service.

9.4 TECHNICAL ASSISTANCE

If you have questions concerning the operation of the Panomat-C pump, call Disetronic Technical Services 24 hours a day:

800-688-4578

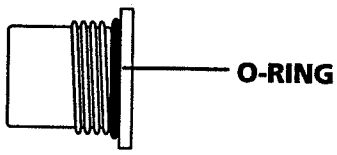
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10.0 REFERENCE

10.1 PUMP MAINTENANCE AND CLEANING

BATTERY REPLACEMENT

Batteries should be replaced when an ERROR 02 or ERROR 03 alarm is activated.



CLEANING

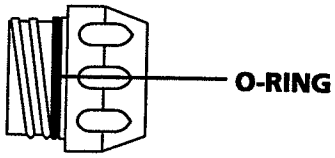
Use only a soft damp cloth to clean the pump housing. Do not use abrasive cleaners or immerse the pump in cleaning fluid. The pump may be cleaned with a mild soap solution.

PISTON ROD AND COG WHEEL

The threaded piston rod and cog wheel assembly should be replaced every 6 to 12 months or sooner if it sticks, shows wear or if the nylon end cap that fits into the glass cartridge becomes loose or broken.

GREY ADAPTER

The grey adapter should be replaced every 3 to 6 months or sooner if the O-ring shows wear. It should also be replaced if a red tappet leg breaks off in the grey adapter.



RED TAPPET

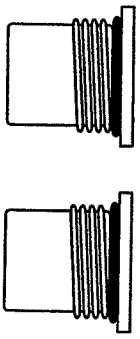
The red tappet should be replaced every 3 months or sooner if a definite snap is not heard when it is inserted. The red tappet should also be replaced if one of the legs breaks off or is missing.

FREE TECHNICAL SAFETY INSPECTION

A free technical safety inspection is required after every 30 months of use. (SECTION 9.1, ERROR 8X for detailed information.)

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10.2 BATTERIES



Batteries need to be changed when ERROR 02 or ERROR 03 appear on the display. Only the battery that is low needs to be changed, both batteries do not need to be changed at the same time. Generally, the electronic battery has a longer life than the motor battery. (SECTION 9.1, ERROR 02, ERROR 03 explain battery replacement) Removing both batteries at the same time will effect the clock and the recordkeeping functions. (SECTION 8.2 explains what to do if both batteries are removed.)

If both batteries have been removed from the pump, always insert a battery into the electronic #3 battery compartment first.

Be sure that batteries are inserted tightly so that they make proper contact. The head of the battery should be just below the surface of the pump housing. A battery tool is provided to assist with battery insertion. Use of other tools or devices is not recommended.

Batteries should remain in their original packaging until ready for use. Batteries should be stored at 68°F (20°C) At normal storage temperatures, self discharge of the initial capacity is as low as 2% in one year. Exposure to high humidity markedly increases self discharge and decreases battery life. DO NOT STORE BATTERIES IN A REFRIGERATOR OR FREEZER.

NOTE: When replacing batteries in the pump, always check to see that a battery has a black O-ring and that it is not frayed or worn. The O-ring is what seals the battery compartment and prevents moisture from entering the pump.

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10.3 ADDITIONAL WARNINGS

Only extension sets and infusion sets that are compatible with the Panomat pumps should be used. Examples are Disetronic numbers 300.0120 to 300.0133.

Removing both batteries will clear the time, accumulated volume, volume remaining and total volume of D Bolus from memory. (SECTION 8.2)

The cog wheel and piston rod assembly, the grey adapter and the red tappets should be replaced as required in Pump Maintenance and Cleaning. (SECTION 10.1)

The pump is not sterile. It is not designed to be sterilized. Sterilization could damage the pump's computer and other parts of the pump.

The pump should be routinely cleaned and kept free of dirt, liquids and foreign objects. See Pump Maintenance and Cleaning. (SECTION 10.1)

Do not operate the pump at temperatures below 32°F or above 122°F.

Do not store the pump at temperatures below -40°F or above 158°F.

Avoid using the pump in close proximity to sources of strong static electricity or strong electromagnetic fields.

Do not use solutions that are incompatible with fluid path materials, fluid container, or administration set or which do not retain stability over the desired storage and/or infusion period.

Use only solutions that are stable under delivery conditions experienced during use with the pump.

Purge the fluid path of all air bubbles before use.

Do not use the pump if the plastic housing is cracked or if a button is damaged.

The pump is waterproof for surface water activity only. This includes showering, bathing, and swimming. This does not include scuba diving. Before any water activity is attempted, follow procedures outlined in Waterproofing the Pump (SECTION 7.5).

This manual is current for two years from the date of issue, if you have this manual for over two years from the issue date, please call Disetronic Technical Services at 800-688-4578 to see if there is a new version.

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10.4 TECHNICAL DATA

Dimensions:	C-3	3.36 x 2.16 x 0.75 in.
	C-5	4.0 x 2.1 x 0.75 in.
	C-10	5.2 x 2.3 x 0.91 in.
Weight:	C-3	3.5 oz.
	C-5	4.0 oz.
	C-10	4.5 oz.
Cartridge Volume:	C-3	3150 µl
	C-5	5000 µl
	C-10	10000 µl
Cartridge Reset Volume:	C-3	3150 µl
	C-5	5000 µl
	C-10	9999 µl
Cartridges:	3.15ml, 5 ml glass with butyl rubber plunger 3.15ml, 5ml, 10ml plastic (polypropylene) with butyl rubber O-rings	
Rate (rAtE) range:	C-3, C-5	0 µl/hr to 2000 µl/hr
	C-10	0 µl/hr to 4000 µl/hr
Rate (rAtE) step:	C-3, C-5	5 µl
	C-10	10 µl
Demand bolus (B) dose range:	C-3, C-5	0 µl to 500 µl
	C-10	0 µl to 1000 µl
Demand bolus (B) dose step:		10 µl
Priming volume:	C-3	25 µl
	C-5, C-10	250 µl
Cartridge empty warnings:	C-3	20 µl, 15 µl, 10 µl, 5 µl
	C-5	400 µl, 300 µl, 200 µl, 100 µl
	C-10	1000 µl, 750 µl, 500 µl, 250 µl
Pump Body:	Impact resistant plastic, all edges rounded	
Waterproof:	For surface water activity Watertight ACC. Standard DIN IEC 601	

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Accuracy	± 2%, nominal
Operating temperature:	32°F to 122°F
Batteries:	Two 3-volt silver oxide batteries (Disetronic 300.0035)
Acoustic signals:	STOP, RUN, button confirmation, alarms, pump stopped
Display Functions:	Programming: Rate (µl/h) Demand Bolus (B) volume (µl)
	Operating: STOP or RUN status Demand Bolus delivery Prime Resetting for a new cartridge Silencing acoustic signals Program lock
	Record Keeping: Time Volume remaining in cartridge Total volume delivered Total volume delivered from Demand Bolus (B)

Pump alarms and warnings:

01 Empty Cartridge	
Cartridge Near Empty	06 Automatic Off
02 Low Motor Battery	07 Electronics Alarm
03 Low Electronic Battery	08 Pump Inspection Due
04 Occlusion Alarm	09 End of Use
Pump in Stop Mode (1 beep every minute)	10 Button Pushed Too Long

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10.5 FACTORY PROGRAMMABLE OPTIONS

The Panomat-C Series pumps are factory programmed to the specifications in the Technical Data. (SECTION 10.4) Additional programming parameters are available within the limits listed below. To change a programming parameter, a written request by a clinician must be received by Disetronic. New pumps can be shipped immediately with the new parameters. The turn-around time on requests for pumps already in service is usually less that two working days at Disetronic.

Rate Maximum:	C-3, C-5 C-10	0-2000 µl/hr 0-4000 µl/hr
Rate Step:	C-3, C-5 C-10	1-50 µl 2-100 µl
Demand Bolus Maximum:	C-3, C-5 C-10	0-500 µl 0-1000 µl
Demand Bolus Step:	C-3, C-5 C-10	1-50 µl 2-100 µl
Priming Volume:	0-1000 µl	
Cartridge Empty Warning 1:	0 to cartridge limit in µl	
Cartridge Empty Warning 2:	0 to cartridge limit in µl	
Cartridge Empty Warning 3:	0 to cartridge limit in µl	
Cartridge Empty Warning 4:	0 to cartridge limit in µl	
Automatic Off:	0-24 hours	

32 EVENT READOUT:

On request, Disetronic Technical Services can provide a clinician with a hard copy readout of the last 32 events of the pump. To perform this service, the pump must be returned to Disetronic.

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10.6 GLOSSARY

#2 BATTERY COMPARTMENT

The opening in the pump for the motor battery.

#3 BATTERY COMPARTMENT

The opening in the pump for the electronic battery.

BATTERY TOOL

A flat red plastic device used to securely tighten the batteries. (Color of tool may change, was red at this printing.)

CARTRIDGE

The plastic or glass container that holds the drug and fits inside the pump.

CARTRIDGE COMPARTMENT

The opening in the pump for the cartridge. The grey adapter screws into the end of this compartment.

COG WHEEL

The nylon wheel that the piston rod turns on to deliver fluid or drug.

DISPLAY

The screen or viewing area on the front of the pump that displays information such as: Operating modes, values and error messages.

DUAL MICROPROCESSORS

The electronic devices that control and check the operation of the pump .

FILLING AID

A clear plastic accessory used with this device to make a cartridge easier to fill. It has finger wings and a grey luer-lock adapter is added.

FLUID PATH

The portion of the delivery system that consists of the cartridge, infusion set and the access device.

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GREY ADAPTER

A grey plastic cylindrical object that screws into the cartridge compartment to hold the cartridge in place. It allows for the attachment of a female luer-lock infusion set. When a red tappet is used in the grey adapter, the cartridge compartment is waterproof. The grey adapter is also used with the filling aid.

"h" BUTTON

A button located on top of the pump that is used in programming, sometimes used in combination with other buttons.

INFUSION

The delivery of fluid or a drug into a patient.

LUER-LOCK CONNECTOR

The fitting which connects the patient's access device and/or infusion set to the administration set.

"m" BUTTON

A button located on top of the pump that is used in programming, sometimes used in combination with other buttons.

NYLON END CAP

The portion of the piston rod assembly that fits into a glass cartridge. It is important that it turns freely and is not broken. (SECTION 5.4)

PANOMAT

Trademark for small ambulatory infusion pumps manufactured by Disetronic Medical Systems Inc.

PANOMAT-C

Panomat pump with one programmable rate and Demand Bolus capabilities.

PANOMAT-T

Panomat pump with one programmable rate, Demand Bolus and Automatic Bolus capabilities.

PANOMAT-V

Panomat pump with variable hourly programmable rate and variable bolus capabilities

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PARTIAL CARTRIDGE

An information display that indicates the calculated volume remaining in the cartridge.

PISTON ROD

A screw-drive mechanism which fits into the pump and into the plunger of the cartridge.

PISTON ROD ASSEMBLY

Refers to the combination of the piston rod and cog wheel. If referring to a glass cartridge it also includes the nylon end cap. The piston rod rotates and the cog wheel remains stationary when fluid is delivered.

PROGRAM LOCK

A keyboard lock, the rate, D Bolus and A Bolus will be locked when this special function is activated.

RATE

One of the options available for delivery. The pump delivers fluid or a drug at a constant rate. The Panomat pumps deliver fluid in µl/h.

RED TAPPET

A two-pronged plastic part which snaps into the two holes of the grey adapter. When the red tappet is in place, the cartridge compartment is waterproof.

RESET

Refers to resetting the pump for a new cartridge, information displays are reset also.

"S" BUTTON

The button located beside the display that is used in programming and information retrieval, sometimes in combination with other buttons.

TOTAL DEMAND BOLUS

An information display that indicates the total volume in µl that has been delivered from the Demand Bolus (B) function. This is a calculated value.

TOTAL VOLUME DELIVERED

An information display that indicates the total volume in µl that has been delivered since resetting, including rate, and Demand Bolus. This display does not include volume from the prime function. This is a calculated value.

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10.7 MICROLITER TO MILLILITER CONVERSION TABLE

5000 µl	=	5.0 ml
1000 µl	=	1.0 ml
250 µl	=	0.25 ml
200 µl	=	0.20 ml
100 µl	=	0.10 ml
75 µl	=	0.075 ml
50 µl	=	0.050 ml
25 µl	=	0.025 ml
5 µl	=	0.005 ml
2 µl	=	0.002 ml
1 µl	=	0.001 ml

10.8 12 HOUR TO 24 HOUR CONVERSION TABLE

Pump runs on Military time or a 24 hour clock.

Standard Clock	Pump Clock	Standard Clock	Pump Clock
1:00 AM	01:00	1:00 PM	13:00
2:00 AM	02:00	2:00 PM	14:00
3:00 AM	03:00	3:00 PM	15:00
4:00 AM	04:00	4:00 PM	16:00
5:00 AM	05:00	5:00 PM	17:00
6:00 AM	06:00	6:00 PM	18:00
7:00 AM	07:00	7:00 PM	19:00
8:00 AM	08:00	8:00 PM	20:00
9:00 AM	09:00	9:00 PM	21:00
10:00 AM	10:00	10:00 PM	22:00
11:00 AM	11:00	11:00 PM	23:00
12:00 AM	12:00	12:00 PM	24:00

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10.9 LIMITED WARRANTY

Disetronic Medical Systems Inc. (the "Manufacturer") warrants to the Original Purchaser that the infusion pump (the "Pump"), not including accessories, will be free from defects in material and workmanship under normal use, if used in accordance with this Operator's Manual, for a period of 24 months from the actual date of sale to the Original Purchaser.

A. Remedy: Subject to the conditions of and upon compliance with this Limited Warranty, the Manufacturer will repair or replace at its option without charge (except for a minimal charge for postage and handling) any Pump (not including accessories) which is defective, if a claim is made during such 24-month period.

B. Exclusions: The warranty does not cover normal wear and tear nor maintenance items, and specifically excludes batteries, administration sets, extension sets or other accessory items or equipment used with the Pump.

There are no other warranties not set forth herein, express or implied. Without limiting the foregoing, all recommendations, information, and descriptive literature supplied by the Manufacturer or its agents are believed to be accurate and reliable but do not constitute warranties. THERE IS NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR THE USE OF THE PUMP FOR ANY PARTICULAR PURPOSE. The Manufacturer disclaims responsibility for the suitability of the Pump for any particular medical treatment or for any medical complications resulting from the use of the Pump.

C. Parties Covered by this Warranty: This warranty extends only to the Original Purchaser of the Pump. This warranty does not extend to subsequent purchasers. The Original Purchaser may be a patient, a clinician, a hospital, or an institution that purchases the Pump for treatment of patients. The Original Purchaser should retain the invoice or sales receipt as proof of the actual date of purchase.

D. Warranty Performance Procedure: Notice of the claimed defect must be made in writing or by telephone to the Manufacturer as follows: Technical Services, Disetronic Medical Systems Inc., 5201 East River Road, Suite 312, Minneapolis, MN 55421-1014 U.S.A.; telephone: 800-688-4578. Notice to the Manufacturer must include the date of purchase, model, and serial number, and a description of the claimed defect in sufficient detail to allow the Manufacturer to determine and facilitate any repairs that may be necessary. AUTHORIZATION MUST BE OBTAINED PRIOR TO RETURNING THE PUMP. If return is authorized, the Pump must be properly and carefully packaged and returned to the Manufacturer, postage prepaid. Any loss or damage during shipment is at the risk of the sender.

E. Additional Conditions of Warranty: The warranty is void if the Pump has been 1.) repaired by someone other than the Manufacturer or its authorized agent; 2.) altered so that its stability or reliability is affected; 3.) misused; or, 4.) damaged by negligence or accident. Misuse includes but is not limited to, use not in compliance with the Operator's Manual or use with non-approved accessories. The Pump is a sealed unit, and the fact that the seal has been broken will be considered conclusive evidence that the Pump has been altered or misused. Removal or damage to the Pump's serial number will invalidate this warranty.

F. Disclaimers and Limitation of Liability: Repair or replacement of the Pump or any component part thereof is the EXCLUSIVE remedy offered by the Manufacturer. The following exclusions and limitations shall also apply:

1. No agent, representative, or employee of the Manufacturer has authority to bind the Manufacturer to any representation or warranty, expressed or implied.

2. The Pump may only be used under the supervision of medical personnel whose skill and judgment determine the suitability of the Pump for any particular medical treatment.

3. The Manufacturer shall not be responsible for any incidental or consequential damages to property, loss of profits, or loss of use caused by any defect or malfunction of the Pump.

This warranty gives the Original Purchaser specific legal rights, and the Original Purchaser may have other legal rights that may vary from state to state.

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