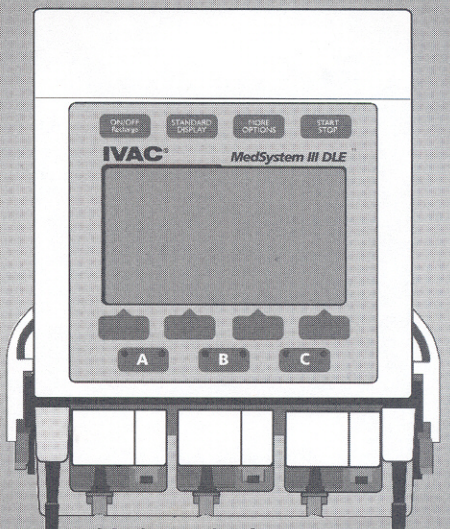
ALARIS™
MEDICAL SYSTEMS

Directions For Use



Multi-Channel Infusion Pump
with Advanced Dose Rate Calculation
and Drug List Editor

Improving and Extending the Quality of Human Life™

TABLE OF CONTENTS

CAUTION: *Federal (U.S.A.) law restricts this device to sale by or on the order of a physician.*

WARNING: *The pump is designed to stop fluid flow under alarm conditions other than the Low Battery and KVO. Periodic patient monitoring must be performed to ensure infusion is proceeding as expected.*

About the Pump

The IVAC® MedSystem III® Drug List Editor Multi-Channel Infusion Pump features:

- Three independent fluid delivery systems in the space of one.
- Compact size:
  - reduces bedside clutter
  - simplifies patient transport
- Easy to set up and use, yet provides advanced features.
- Accurate delivery of a variety of fluids.
- Accommodates assorted container types.
- Multiple delivery methods:

  Intravenous
  Intra-arterial
  Subcutaneous
  Epidural

- Uses administration sets that provide free-flow protection.
- Six available Device Types with configurable parameters (maximum and minimum rates, maximum volumes, baseline and maximum pressures, and air-in-line thresholds) to achieve specific clinical applications:

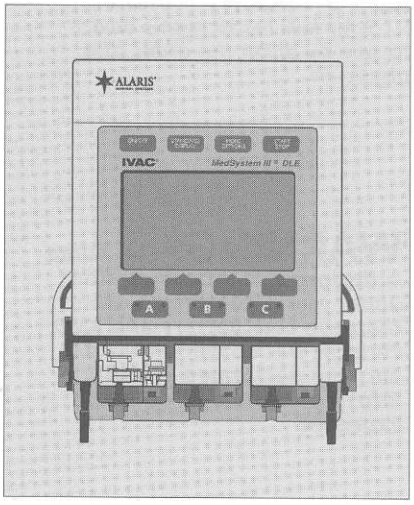
  General Purpose
  Neonatal
  Controller Pressure
  Operating Room
  General Purpose II
  Operating Room II

- Displays infusion status for rate, volume remaining and volume infused.
- Infusions can be programmed to deliver at a specified rate or over a specified period of time.
- Secondary mode allows fluids and medications to be delivered at two different rates, sequentially.
- Dose Rate Calculator (DRC) feature performs volumetric rate and/or dose rate calculations.
- Drug List Editor - Allows customization of a resident drug list.
- With DRC activated, displays infusion status for rate, dosing regimen and drug name.
- Communications Protocol allows clinical monitoring, instrument configuration and maintenance.
- Field Maintenance Software (FMS) available for Biomed to configure, service, and troubleshoot.

Features

Multi-channel Fluid Delivery System

The instrument combines three independent infusion channels in an unparalleled small size.



Lightweight/portable

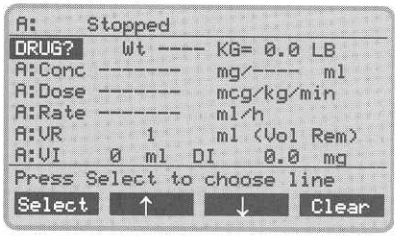
The pump with pole clamp weighs just over 5 pounds and is easy to transport.

Unique, rotating pole clamp

The pump may be attached to a variety of surfaces.

Dose Rate Calculator (DRC)

The pump calculates a volumetric or dose rate based on values entered for patient weight, drug concentration (drug amount and diluent volume) and dosing parameters.

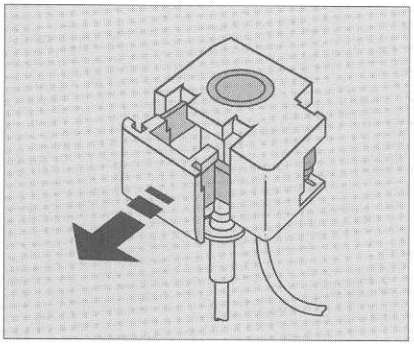


Drug List Editor (DLE)

The pump drug list can be customized using Drug List Editor software.

Six Device Types available

General Purpose, Neonatal, Controller Pressure, Operating Room, General Purpose II, and Operating Room II.



Free-flow Protection

The MedSystem 28 Series Administration Sets contain a cassette that provides protection from free-flow conditions. To remove the cassette from the pump, the cassette's slide clamp is pulled to full extension, occluding the tubing and preventing fluid from flowing.

Monitoring System

The instrument continuously monitors pump conditions and alerts with adjustable audio tones and visual messages.

Data Monitoring

The pump can be configured to communicate with a remote computer, such as a centralized patient monitoring nurse's station. The COMM receptacle is compatible with RS-232 cabling. A communications manual that describes the programming and hardware involved is available.

Field Maintenance Software (FMS)

The pump can be modified to accommodate specialized clinical applications. The Device Type parameters, occlusion limit, and air-in-line threshold can be configured with the FMS software.

Secondary Mode

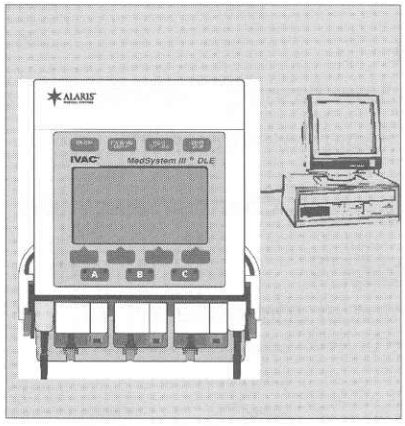
Allows the user to program two different rates of infusion to run sequentially.

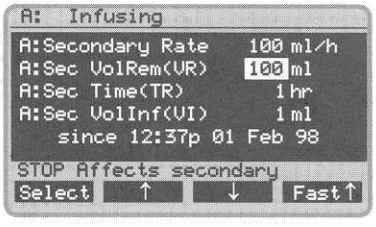
Full Range of Delivery Rates

Rates from 0.1 to 999 milliliters per hour.

Battery Capacity

A fully-charged battery provides 6 to 8 hours of operating time with rates at 125 ml/h per channel.





System Components

FRONT PANEL

Instrument Keys

Display Screen

Softkey Pads

Channel Indicator Lights

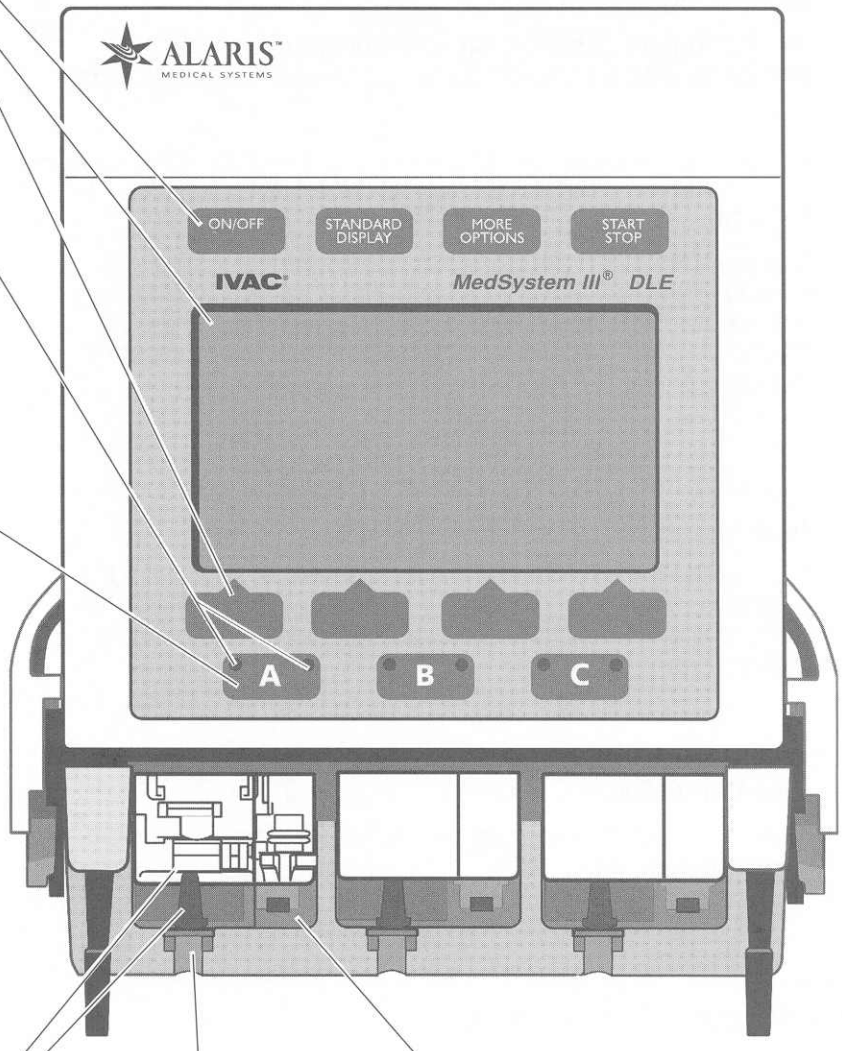
Green:

- Steady - infusing on AC power
- Flashing - infusing on battery power

Red:

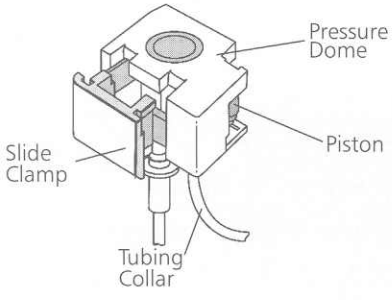
- Slow flashing - Advisory
- Rapid flashing - Alert

Channel Select Keys

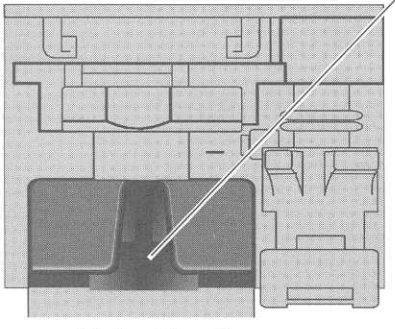


CASSETTE

Portion of administration set, inserts into cassette holder.

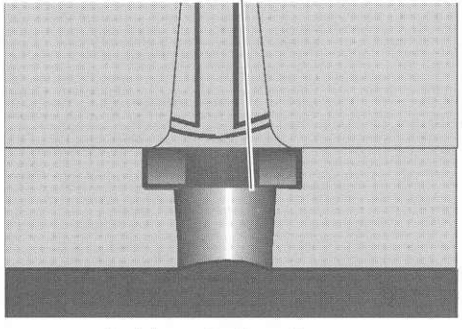


LOWER ASSEMBLY



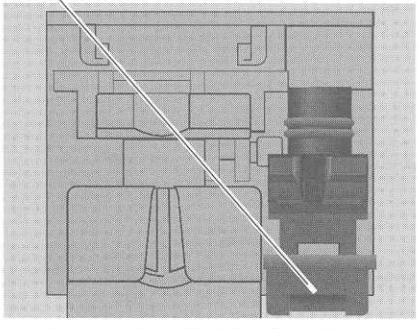
Air-in-Line Sensor

Detects bubbles of air during infusion.



Tubing Collar Recess

Holds tubing collar in place.



Pump Latch Mechanism

Drives the cassette piston to move fluid through the tubing.

CONNECTOR PANEL

External Power

External power receptacle connects with power cord.

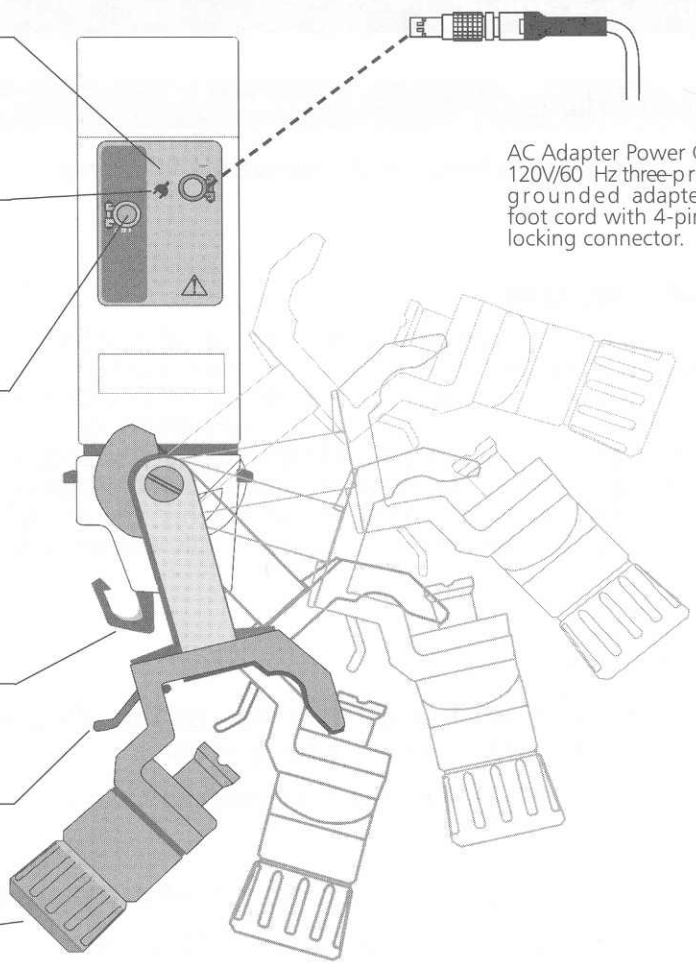
Plug Symbol

Green light on indicates AC power is connected; batteries are charging.

COMM

Communications line receptacle connects with RS-232.

NOTE: When inserting or removing connectors to the receptacles, avoid excessive force or twisting.



AC Adapter Power Cord 120V/60 Hz three-pronged grounded adapter on 10 foot cord with 4-pin locking connector.

Container Hook

One hook on each side of the instrument.

Rotating Latch

Allows clamp to spin 360° and position at every 90°.

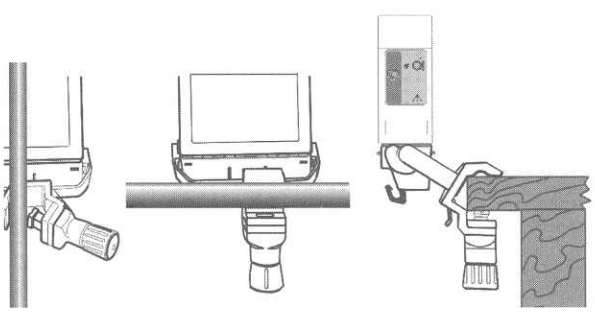
Adjustable Pole Clamp

Jaw with clutch feature, mounts pump to a pole or bedside.

NOTE: The MedSystem III pump is designed to function in any orientation. However, the effectiveness of the administration set air trap is diminished when the instrument is in other than vertical position.

Attaching Pole Clamp

To attach the pole clamp, position the clamp jaw over the mounting surface and turn the knob until the clamp is tightened and the pump feels secure. When the knob is as tight as possible, continued turning will make it click and spin freely without over-tightening.



Operational Precautions

Patient Precautions

To avoid possible injury to the patient, observe the following precautions:

Epidural Administration

The MedSystem III pump can be used for epidural administration of anesthetic and analgesic drugs. This application is only appropriate when using anesthetic and analgesic drugs labeled for continuous epidural administration and catheters intended specifically for epidural use. Use only a MedSystem III 28 series set, **without** a 'Y' connector or injection port, for epidural infusions. The pump's secondary mode must **not** be used when the pump is being used for epidural administration of anesthetic and analgesic drugs.

WARNING: *Epidural administration of drugs other than those indicated for epidural use could result in serious injury to the patient.*

WARNING: *It is strongly recommended that the infusion pump source container and administration set used for epidural drug delivery be clearly differentiated from those used for other types of administration.*

Administration Sets

- Use only MedSystem III 28 Series Administration Sets. The use of other sets will cause improper pump operation.
- Always power on the instrument before inserting the set.
- Do not use the set if damaged.
- Do not insert a cassette into a channel with a SERVICE prompt.
- Remove any cassettes from channel(s) requiring service.
- Ensure the cassette is properly installed before starting infusions.

Electromagnetic and Radio Frequencies

Operating the pump near equipment which radiates high-energy electromagnetic and radio frequencies (electrosurgical/cauterizing equipment, portable radios, cellular telephones, etc.) may cause false alarm conditions. If this happens, reposition the pump away from the source of interference, or turn off the pump and manually regulate the flow with the administration set regulating clamp.

WARNING: *Use of accessories or cables other than those specified may result in degraded electromagnetic compatibility performance of this device.*

Artifacts

It is normal for intravenous infusion devices to produce non-hazardous currents when infusing electrolytes. These currents vary at a rate proportional to the infusion device flow rate. When an ECG monitoring system is not functioning under optimal conditions, these currents may appear as artifacts, simulating actual ECG readings. To determine if ECG abnormalities are caused by patient condition or the ECG equipment, place the infusion device on hold. If the ECG readings become normal, the ECG equipment requires attention. Proper setup of the ECG equipment should eliminate these artifacts. Reference the appropriate ECG monitoring system documentation for instructions on setup and maintenance.

Dropping/Jarring

If a pump is dropped or severely jarred, it should be immediately taken out of service and inspected by qualified service personnel to ensure proper function prior to reuse.

User Precautions

To ensure proper performance of the pump and to reduce potential injury to the operator, observe the following precautions:

- The AC adapter must be connected to a properly grounded, 3-wire receptacle ("Hospital Use" or "Hospital Grade").
- Avoid excessive force or twisting of detachable power cords when inserting or removing connector terminals.
- Use AC adapter indoors only.
- Disconnect AC and battery power when performing maintenance.
- Do not use the pump in the presence of flammable anesthetics.
- Do not open the instrument case. The case should only be opened by qualified service personnel using proper grounding techniques.
- Do not stack instruments on top of each other.

WARNING: *When the case is opened, an electrical shock hazard exists which can result in serious injury to persons and damage to instrument components.*

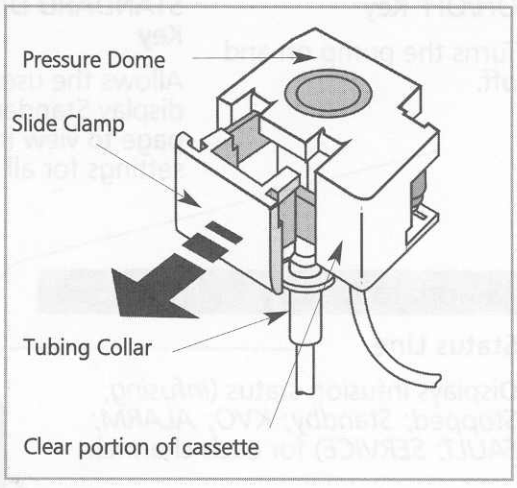
Preparing the Infusion

Prepare solution container in accordance with the manufacturer's instructions.

- A syringe can be used as the container for the IV fluid to be infused. Syringe sizes from 20cc to 60cc of the B-D and Monoject® brands can be used.

NOTE: The IVAC Model 8631A Syringe Holder is available as an accessory that provides a convenient place to hold syringes while they are being used as containers for IV fluid. The Syringe Holder is designed to be easily installed and removed from the top of the pump and to support up to three syringes. Do not use the Syringe Holder as a handle to carry the pump.

Connect the container to the IV set.



Preparing the Administration Set

Prime the MedSystem III 28 Series administration set in accordance with the Administration Set Directions for Use.

It is important to prime the set properly to eliminate air bubbles.

Ensure the cassette slide clamp is pushed in completely so tubing is not occluded.

Invert the cassette so tubing is up. Slowly open the regulating clamp and establish fluid flow to fully prime the set. Gently tap the cassette and 'Y' sites as necessary to remove all air. Gently massage the pressure dome to ensure no air bubbles are trapped.

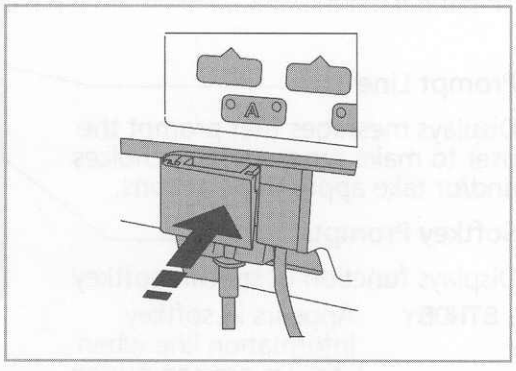
WARNING: *An open regulating clamp and slide clamp can cause a free-flow condition and may result in serious injury to the patient.*

Loading the Set

Close the regulating clamp before inserting and removing the cassette to reduce the risk of free flow.

Press ON/OFF to turn pump on.

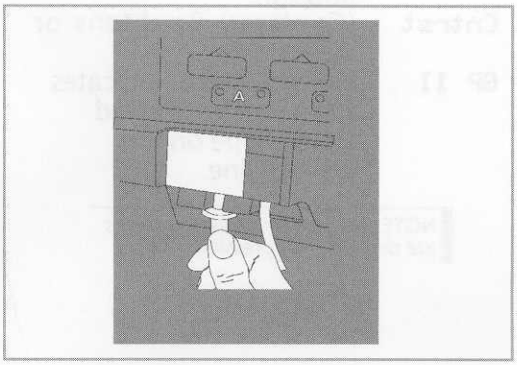
With tubing down, use a 45-degree upward motion to insert cassette into channel.



Push on clear portion of cassette until completely seated. Then push in slide clamp flush with entire cassette.

Pull down gently on tubing collar. Press with thumb to seat tubing collar in recess beneath cassette.

NOTE: Three beeps sound when inserted properly.



Front Panel Overview

Instrument Control Keys

ON/OFF Key

Turns the pump on and off.

STANDARD DISPLAY Key

Allows the user to display Standard Display page to view infusion settings for all channels.

MORE OPTIONS Key

Allows the user to display additional softkey functions.

Channel Control Key

START/STOP Key

Starts or stops infusion on selected channel.

Standard Display Page

Status Line

Displays infusion status (*Infusing; Stopped; Standby; KVO; ALARM; FAULT; SERVICE*) for each channel.

NOTE: Status line in selected channel is highlighted.

Infusion Rate

Volume Remaining (ml)

Volume Infused (ml)

Prompt Line

Displays messages that prompt the user to make programming choices and/or take appropriate actions.

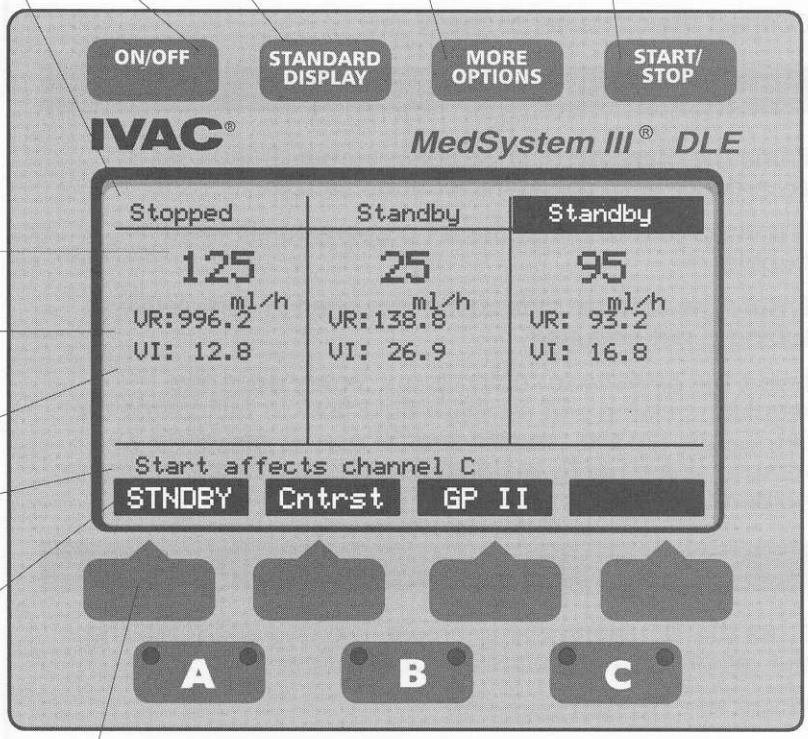
Softkey Prompts

Displays function of specific softkey.

- **STNDBY** Appears in softkey information line when START/STOP is pressed during infusion.
- **Cntrst** (Contrast) Brightens or dims display.
- **GP II** When pressed, indicates full name of selected Device Type on the prompt line.

NOTE: Additional softkey prompts are displayed by pressing MORE OPTIONS.

Softkey Pads (4)



Programming Page

Selected channel is indicated by the letter displayed at the beginning of the first five lines.

Status Line

Displays infusion status for selected channel.

Infusion Rate

Volume Remaining

Time Remaining

Volume Infused

Date/Time

Displays when volume infused was last cleared and infusion began.

Prompt Line

Displays messages that prompt the user to make programming choices and/or take appropriate action.

Softkey Prompts

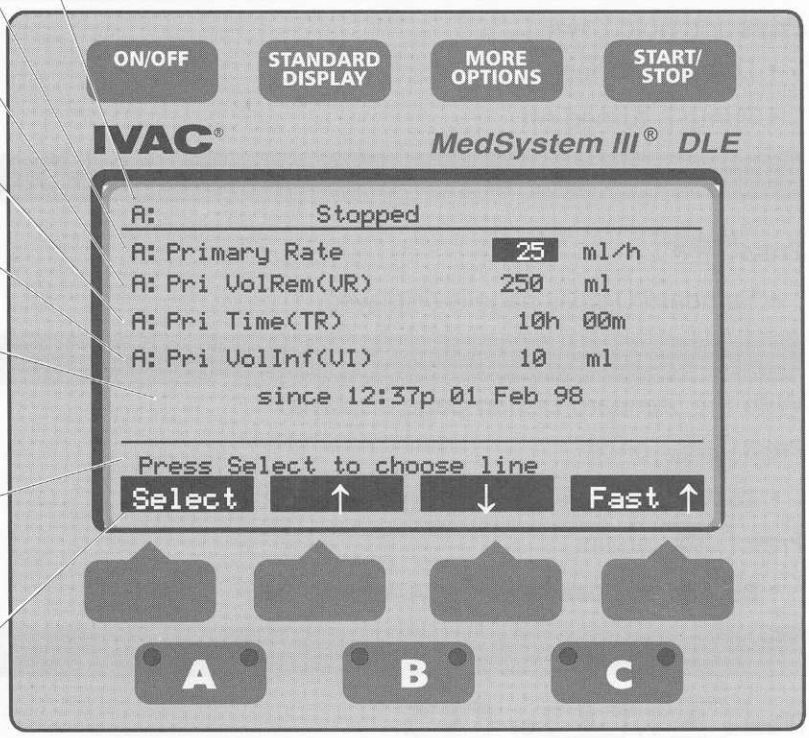
Displays function of specific softkey.

Select – Moves highlight bar through the programmable infusion parameters.

↑ – Increases highlighted value.

↓ – Decreases highlighted value.

Fast ↑
Fast ↓
– Increases or decreases highlighted value at greater increments.



To turn pump on

Press [ON/OFF].

- Upon start-up, the instrument performs an automatic self-test. Listen for a "beep" to ensure that the audio alarm transducer functions properly.
- Instrument Information page is momentarily displayed.
- Continuing to hold down ON/OFF key will keep the Information page on the display.
- When the ON/OFF key is released, the Standard Display page is displayed.

To turn pump off

Press and hold [ON/OFF].

- Display disappears.
- Pump is turned off.

To view infusion settings for all active channels

Press [STANDARD DISPLAY].

- Standard Display page is displayed.

To activate additional Standard Display softkey prompts

With the Standard Display page displayed:

Press [MORE OPTIONS] once.

- **TotVol**, **Device**, **Config**, and **Note** softkeys appear.

Press [MORE OPTIONS] again.

- **Batlog** and **DemoWD** softkeys appear.

To select channel and display Programming Pages

Press [A], [B] or [C].

- Selected channel programming page is displayed.

With programming page displayed:

To program infusion

Press Select to choose value to change.

- Value is highlighted.

Scroll through values using ↑, ↓, **Fast** ↑ or **Fast** ↓.

- ↑ and **Fast** ↑ increase highlighted values in single or multiple increments.

- ↓ and **Fast** ↓ decrease highlighted values in single or multiple increments.
- Pressing ↑ or ↓ changes direction of the **Fast** ↑ or **Fast** ↓.
- Highlight remains flashing until **Enter** is pressed. If **Enter** is not pressed, the entry incomplete advisory will sound.

Press **Enter** to accept new value.

- Highlight moves to next programmable value if channel status is **Stopped** or **Standby**.
- If status is Infusing, highlight remains on selected value.

To recall a previous value after a new value is introduced but not entered, press MORE OPTIONS.

- Recall soft key appears.

Press **Recall**.

- Number returns to previous value.

Press START STOP.

- Infusion starts or stops immediately, unless the channel's programming is incomplete, or if an advisory, alarm, or fault condition exists on selected channel.

To access alarm information

- **ALARM** is displayed in affected channel status line.
- Alarm condition is displayed on the Standard Display of the affected channel.

See the TROUBLESHOOTING section of this manual for more alarm information.

Press affected channel A, B or C.

- Alarm Information page is displayed for that channel.

To activate additional Programming Page softkeys

With the programming page displayed:

Press MORE OPTIONS.

Press **2° Sec** to access Secondary page

OR

Press **CalcOn** to access Dose Rate Calculation page.

See the ADVANCED OPERATION section of this manual for information on the use of the Dose Rate Calculator function.

Programming Primary Infusion

To set primary rate

Press [A], [B] or [C].

- Programming Page is displayed.
- Rate is highlighted.

Press **Select** if current rate is desired

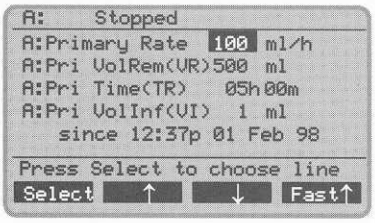
OR

Press ↑, ↓, **Fast** ↑ or **Fast** ↓ to change rate.

- Value flashes.

Press **Enter** to confirm.

- Highlight moves to volume remaining (VR)



To set primary volume remaining (VR)

Press **Select** if current VR is desired

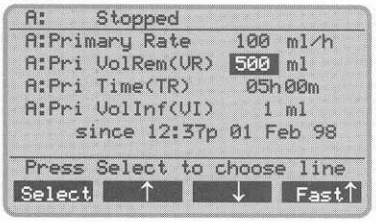
OR

Press ↑, ↓, **Fast** ↑ or **Fast** ↓ to change VR.

- Value flashes.

Press **Enter** to confirm.

- Primary time remaining (TR) is calculated automatically based on VR and rate.
- Highlight moves to volume infused (VI).



To clear primary volume infused (VI)

Press **Select** if current VI is desired

OR

Press **Clear** to reset volume infused to zero.

- Date and time are cleared.
- **Clear** softkey switches to **Recall**.

Press **Enter** to confirm

OR

Press **Recall** softkey to recall previous VI, date and time.

THEN

Open regulating clamp on administration set.

Press [START STOP] to begin infusion.

- Channel starts infusing.
- Current date and time are entered.

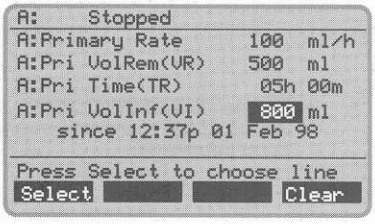
Press [STANDARD DISPLAY].

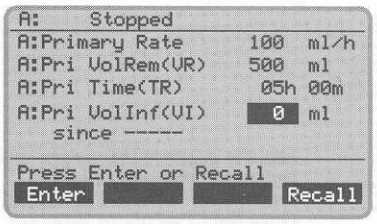
OR

- Display reverts to Standard Display page after one minute.

Verify settings.

Verify solution flow from secondary container.





Making Changes While Infusing

To titrate or change primary rate during infusion

Press A, B or C.

- Programming Page is displayed.
- Rate is highlighted.

Press ↑, ↓, Fast ↑ or Fast ↓ to change Rate

- Value flashes.

Press **Enter** to confirm.

- New rate begins infusing immediately.

To change volume remaining during infusion

Press A, B or C.

- Programming Page is displayed.
- Rate is highlighted.

Press **Select** to highlight VR.

Press ↑, ↓, **Fast** ↑ or **Fast** ↓ to change VR.

- Value flashes.

Press **Enter** to confirm.

- Infusion continues with new volume remaining.

To clear volume infused during infusion

Press A, B or C.

- Programming Page is displayed.
- Rate is highlighted.

Press **Select** to highlight VI.

Press **Clear** then **Enter** to reset volume infused to zero.

- Date and time are cleared.
- **Clear** softkey switches to **Recall**.

Press **Enter** to confirm

- Infusion continues with volume infused reset to zero.
- Current date and time are entered.

OR

Press **Recall** softkey to recall previous VI value, date and time.

NOTE: When the channel VI is cleared, that volume is not subtracted from the volume on the TotVol page.

To simultaneously clear Total Volume Infused for all channels

Press STANDARD DISPLAY.

- Standard Display page is displayed.

Press MORE OPTIONS.

- **TotVol**, **Device**, **Config** and **Note** softkeys appear.

Press **TotVol** softkey.

- Total Volume page is displayed
- VI for each channel and total pump VI values are highlighted.

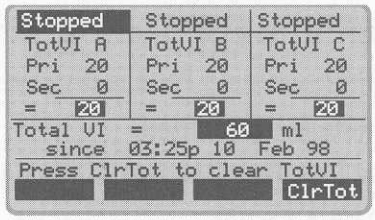
Press **ClrTot** to reset volume infused to zero.

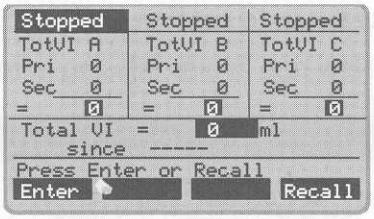
- Date and time are cleared.

Press **Enter** to accept clearing of all values.

OR

Press **Recall** softkey to recall the previous Total VI, date and time.





To place a channel on Standby during infusion

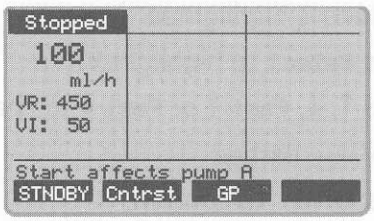
Press appropriate channel A, B or C.

Press START STOP to stop infusion.

Press STANDARD DISPLAY.

- Standard Display page is displayed.

Press **STNDBY**.



NOTE: When a channel is Stopped for two minutes with a cassette in place, a Channel Not In Use advisory sounds. When a channel is on Standby, the advisory does not sound.

To start an infusion from Standby status

Press appropriate channel A, B or C.

Press START STOP to start infusion.

NOTE: Infusing channel should always be stopped prior to removing cassette.

Programming Option

To set up an infusion by Rate/Volume or Volume/Time

Press START STOP if channel is infusing.

Press STANDARD DISPLAY if Standard Display page not already displayed.

Press MORE OPTIONS.

- **TotVol**, **Device**, **Config** and **Note** softkeys appear.

Press **Config** softkey.

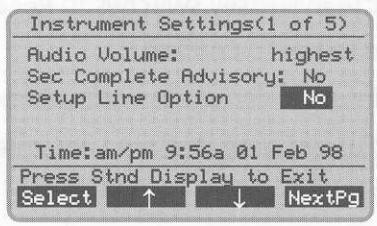
- The first of five Instrument Settings pages is displayed.

Press **Select** to move the highlight to Setup Line Option.

Press ↑ or ↓ to choose Yes.

Press **Enter** to enable programming option.

Press channel A, B or C.



Press **Select** to move highlight to

Setup: Select VR and Time

OR

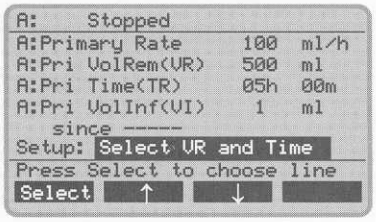
Setup: Select VR and Rate

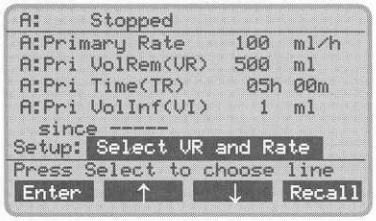
If highlighted choice is not desired, press ↑ or ↓ to change setup choice.

- Choice flashes.

Press **Enter** to accept.

- Highight moves to top of page.
- Enter desired settings.





NOTE: Rate will highlight but cannot be changed if Volume/Time option is active. Time remaining selection will highlight but cannot be changed if Rate/Volume option is active.

KVO Status

To resume infusion when VR=0 (KVO)

With a channel infusing at KVO rate:

- Green light on channel key remains on.
- Red light on channel key flashes.
- Two toned advisory sounds.

Press appropriate channel [A], [B] or [C] twice.

- VR is highlighted.

Press **REPEAT** to recall previous VR.

OR

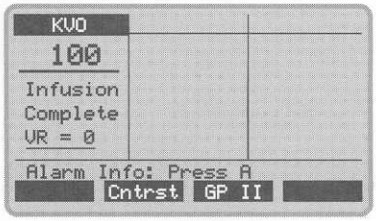
Press ↑, ↓, **Fast** ↑ or **Fast** ↓ to change VR.

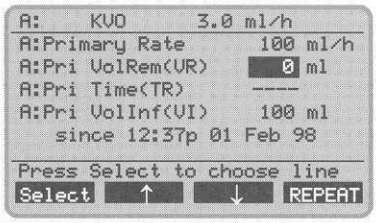
- Value flashes.

Press **Enter** to confirm.

Press [START STOP] to resume infusion and stop KVO rate.

NOTE: If current infusion rate is set below KVO rate, channel will infuse at the lower rate.



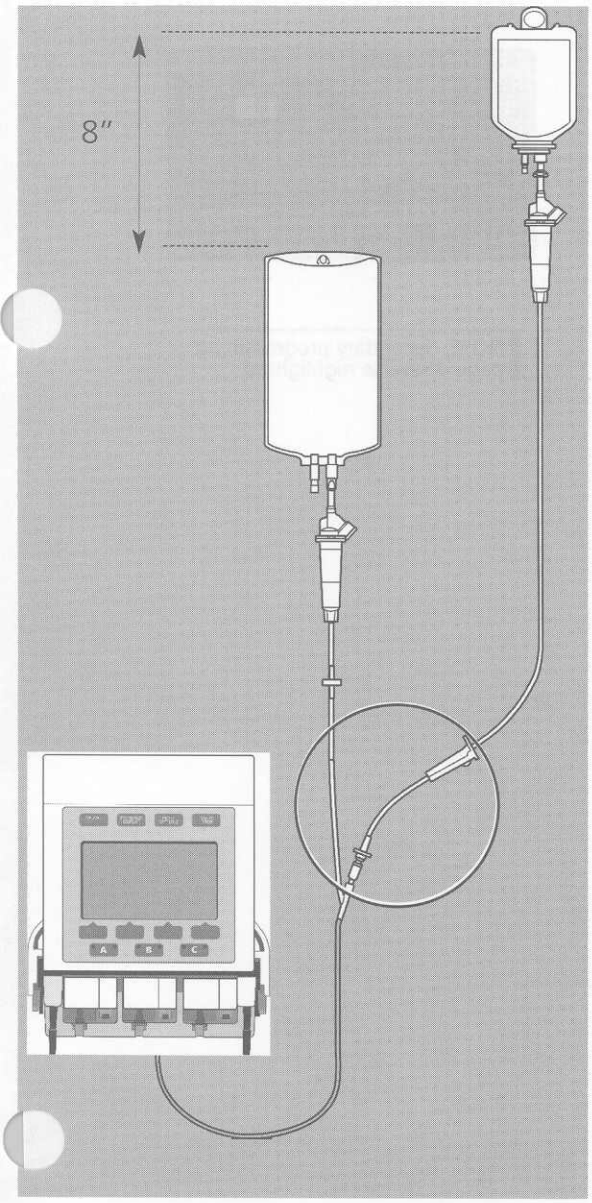


Secondary Mode

This option allows two different rates of infusion to be administered sequentially. When secondary volume remaining reaches zero, primary infusion resumes automatically.

To avoid the possibility of concurrent flow during secondary delivery of intermittent medications, set up the administration set as recommended below.

Preparing the Administration Set and Container



- For Needle-free sets, attach secondary to upper primary 'Y' site, below a check valve.
- For Non-Needle-free sets, use a 16-gauge needle to attach secondary set to upper primary 'Y' site, below a check valve.
- Prepare the secondary IV container according to your institution´s policy.
- Suspend secondary solution container at least 8 inches above primary solution container.
- Press A, B or C to select channel.

WARNING: *Setting a secondary rate over 275 ml/h may result in concurrent flow with the primary container.*

Programming Secondary Infusion

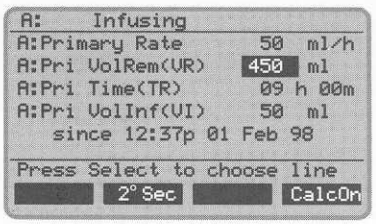
Press A, B or C.

- Primary programming page is displayed.

Press MORE OPTIONS.

Press 2° Sec softkey.

- Secondary programming page is displayed.



To set secondary volume remaining(VR)

Press **Select** to highlight secondary VR, if necessary.

Press **REPEAT** to enter the last VR selected.

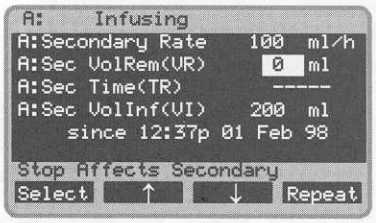
OR

Press ↑, ↓, **Fast** ↑ or **Fast** ↓ to change VR.

- Value flashes.

Press **Enter** to confirm.

- Secondary time remaining (TR) is calculated automatically, based on VR and Rate.
- Highlight moves to secondary volume infused (VI).



NOTE: Secondary programming page is reverse highlighted.

To clear secondary volume infused(VI)

Press **Select** if current VI is desired

OR

Press **Clear** to reset volume infused to zero.

- Date and time are cleared.
- **Clear** softkey switches to **Recall**.

Press **Enter** to confirm

OR

Press **Recall** softkey to recall previous VI value, date and time.

To set secondary rate

Press **Select** if current rate is desired

OR

Press ↑, ↓, **Fast** ↑ or **Fast** ↓ to change Rate.

- Value flashes.

Press **Enter** to confirm.

THEN

Open regulating clamp on secondary administration set.

Press START STOP to begin infusion.

- Four tones sound (if primary infusion is in progress).
- Pump starts infusing at secondary rate.
- Current date and time are entered.

Press STANDARD DISPLAY

OR

- Display reverts to Standard Display page after one minute.

Verify settings.

Verify solution flow from secondary container.

To titrate or change secondary rate during infusion

Press A, B or C.

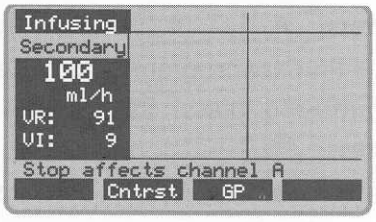
- Secondary programming page is displayed.
- Rate is highlighted.

Press ↑, ↓, Fast ↑ or Fast ↓ to change rate.

- Value flashes.

Press Enter to confirm.

- New rate begins infusing immediately.



NOTE: Channel display on the Standard Display is reverse highlighted.

To review or change primary value(s) during secondary infusion

Press A, B or C.

- Secondary programming page is displayed.

Press MORE OPTIONS.

- 1° Pri and CalcOn softkeys appear.

Press 1° Pri softkey.

- Primary programming page is displayed.

Press Select to highlight value(s) to change.

Press ↑, ↓, Fast ↑ or Fast ↓ to change value(s).

Press Enter to confirm.

To start primary infusion before secondary completes

Close regulating clamp on secondary infusion set.

Press A, B or C.

- Secondary programming page is displayed.

Press MORE OPTIONS.

- 1° Pri and CalcOn softkeys appear.

Press 1° Pri softkey.

- Primary programming page is displayed.

Press START STOP to begin primary infusion and stop secondary infusion.

- Four tones will sound.
- Infusion starts at primary rate.

WARNING: *Pressing START STOP will result in the remaining secondary medication being delivered at the primary rate.*

Dose Rate Calculator (DRC) Programming using a specific drug name

With this feature, the instrument calculates a volumetric or dose rate based on values entered for patient weight, drug concentration (drug amount and diluent volume) and dosing parameters. If a dose is entered, the volumetric rate is calculated. If a volumetric rate is entered, the dose is calculated.

WARNING: *Ensure correct entry of all drug calculation infusion parameters. Consult the drug manufacturer's labeling for information concerning appropriate administration guidelines and dosages.*

Press [A], [B] or [C].

- Primary programming page is displayed.

If infusing, press [START STOP] to stop infusion.

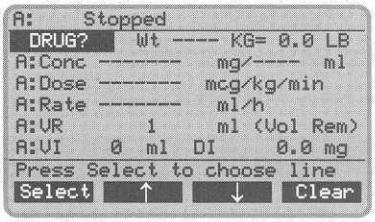
Press [MORE OPTIONS].

- **2* Sec** and **CalcOn** softkeys appear.

Press **CalcOn**.

- Dose Rate Calculator programming page is displayed.
- **DRUG?** is highlighted.

NOTE: Dose Rate programming page will not display if channel is infusing. If infusing in secondary mode, switch to primary mode and stop infusion before proceeding.



Programming Drug

Scroll using arrow softkeys to display alphabetized, abbreviated drug names.

- ↓ moves A to Z.
- ↑ moves Z to A.
- **Fast** ↑ and **Fast** ↓ moves alphabetically through the drug name list. By default, **Fast** goes to the next letter of the alphabet.

Press **Enter** when desired drug name is highlighted.

- Highlight moves to **Wt**.

NOTE: Pressing [A], [B] or [C] at any time during DRC set-up, returns the highlight to the top of the page.

Programming Weight

Choose patient's kilogram weight using the ↑, ↓, **Fast** ↑ and **Fast** ↓ softkeys.

Press **Enter** when desired weight is displayed.

- Highlight moves to **Conc**.

NOTE: Changing drug name clears previous values and changes drug concentration and dose rate parameters to parameters appropriate for the selected drug.

Programming Concentration

Choose concentration using the ↑, ↓, **Fast** ↑ and **Fast** ↓ softkeys.

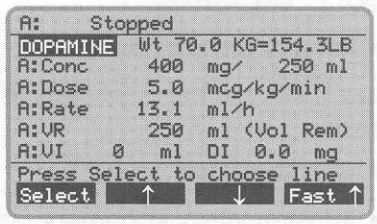
Press **Enter** when desired concentration is displayed.

- Highlight moves to value for diluent volume.

Choose diluent volume using the arrow softkeys.

Press **Enter** when desired volume is displayed.

- VR is automatically set when the diluent volume value is entered but can be changed if desired.
- Highlight moves to **Dose**.



Programming Dose

Choose dose using the ↑, ↓, **Fast** ↑ or **Fast** ↓ softkeys.
Press **Enter** when desired dose is displayed.

- Volumetric rate is automatically calculated.
- Highlight moves to **Rate**.

NOTE: Calculated rates for infusion are fractional and will be displayed as a fraction on the Standard Display even if Device Type is set for whole numbers.

Changing Volumetric Rate

Choose rate value using the ↑, ↓, **Fast** ↑ or **Fast** ↓ softkeys if dose rate is not as desired.
Press **Enter** when desired volumetric rate is displayed.

- When rate is changed, dose value is automatically calculated.
- Highlight moves to VR.

Changing Volume Remaining

Change VR value using the ↑, ↓, **Fast** ↑ or **Fast** ↓ softkeys.
Press **Enter** when desired VR is displayed.

- Highlight moves to VI.

Clearing the Volume Infused(VI) and Dose Infused(DI)

Press **Clear** then **Enter** to reset volume infused to zero.

- Highlight moves to DI.

Press **Clear** then **Enter** to reset dose infused to zero.
Open regulating clamp.
Press START STOP to begin infusion.

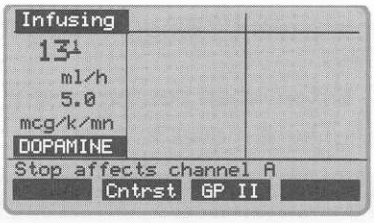
- Channel starts infusing.

Press STANDARD DISPLAY

OR

- Display reverts to Standard Display page after one minute.
- DRC parameters are displayed.

Verify settings.
Verify solution flow from secondary container.



NOTE: Stop infusion to make changes to the drug name, weight, or concentration.

Changing DRC values while infusing

Press A, B or C.

- Dose Rate Calculator programming page is displayed.
- Dose value is highlighted.

Press **Select** to scroll through values that can be changed.
When highlight is on value to be changed (*Dose, Rate, VR, VI, DI*), use ↑, ↓, **Fast** ↑ or **Fast** ↓ softkeys until desired value is displayed.

- When dose is changed, rate is automatically recalculated.
- When rate is changed, dose is automatically recalculated.

When highlight is on value for VI or DI, **Clear** softkey becomes active. Pressing the **Clear** softkey changes the value to 0.0.
Press **Enter** after each value change to accept the new value.

- New rate begins infusing immediately.

Press STANDARD DISPLAY

OR

- Display reverts to Standard Display page after one minute.

Verify settings.
Verify solution flow from secondary container.

Dose Rate Calculator Programming with DRUG?

The **DRUG?** selection can be used to calculate a drug not listed in the pump or for an alternative dosing regimen.

Press (A), (B) or (C).

- Primary programming page is displayed.

Press (START/STOP) if channel is infusing.

Press (MORE OPTIONS).

- **2° Sec** and **CalcOn** softkeys appear.

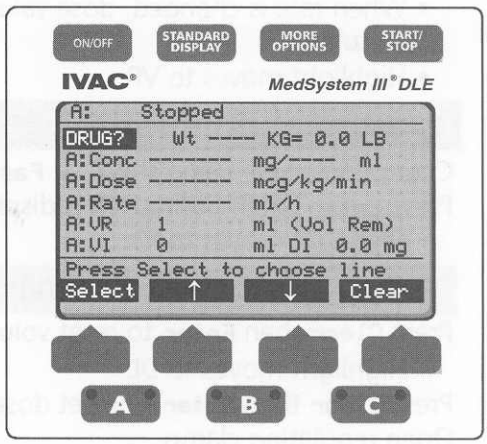
Press **CalcOn**.

- Dose Rate Calculator programming page is displayed.
- **DRUG?** is highlighted.

Press **Select**.

- Highlight moves to **Wt**.

NOTE: Dose Rate programming page will not display if channel is infusing. If infusing in secondary mode, switch to primary mode and stop infusion before proceeding.



Programming Weight

Choose patient's kilogram weight using ↑, ↓, **Fast** ↑ and **Fast** ↓ softkeys.

Press **Enter** when desired weight is displayed.

- Highlight moves to **Conc**.

Programming Concentration

Choose concentration using ↑, ↓, **Fast** ↑ and **Fast** ↓ softkeys.

Press **Enter** when desired concentration is displayed.

- Highlight moves to concentration parameters.

Choose desired concentration parameters using ↑, ↓, **Fast** ↑ and **Fast** ↓ softkeys.

Press **Enter** when desired parameter is displayed.

- Highlight moves to value for diluent volume.

Choose diluent volume value using ↑, ↓, **Fast** ↑ and **Fast** ↓ softkeys.

Press **Enter** when desired volume is displayed.

- VR is automatically set when the diluent volume is entered, but can be changed if desired.
- Highlight moves to **Dose** parameters.

Drug concentration parameters

Gm, mg, mcg, mMol, mEq, mUn, Un

Programming Dose

Choose dose parameters (measure/weight/time) using ↑, ↓, **Fast** ↑ and **Fast** ↓ softkeys.

Press **Enter** when each desired dose parameter is displayed.

- Highlight moves to next parameter each time **Enter** is pressed.
- Highlight moves to **Dose** when **Enter** is pressed to accept time value.

Choose dose using ↑, ↓, **Fast** ↑ and **Fast** ↓ softkeys.

Press **Enter**.

- Highlight moves to **Rate** parameters.

Dose parameters

measure	—	Gm, mg, mcg, Ng, mMol, mEq, mUn, Un
weight	—	kg
time	—	min, h, or day

Changing Volumetric Rate

Choose volumetric rate using arrow softkeys if dose calculation is not desired.

Press **Enter** when desired rate is displayed.

- When rate is changed, dose is automatically calculated.
- Highlight moves to VR.

Changing Volume Remaining

Choose VR value using the arrow softkeys.
Press **Enter** when desired VR is displayed.

- Highlight moves to VI.

Clearing Volume Infused (VI) or Dose Infused (DI)

Press **Clear** then **Enter** to change VI value to 0.

- Highlight moves to DI.

Press **Clear** then **Enter** to change DI value to 0.
Open regulating clamp.
Press START STOP to begin infusion.

- Channel starts infusing.

Press STANDARD DISPLAY

OR

- Display reverts to Standard Display page after one minute.
- DRC parameters are displayed.

Verify settings.
Verify flow.

Editing Drug List

The Drug List Editor can be used to edit/customize drug list.
See Directions For Use for Drug List Editor (DLE).

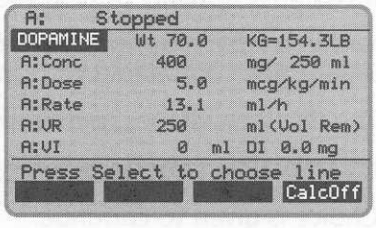
Discontinuing DRC option

Press A, B or C.

- Dose Rate Calculator programming page is displayed.

Press START STOP to stop if infusing.
Press MORE OPTIONS.
Press **CalcOff**.

- Display reverts to primary programming page.
- Volumetric rate, volume remaining and volume infused from DRC are carried over to the primary programming page.



Facts about DRC

- *Drug name, patient weight, or drug concentration cannot be changed while infusing. Changes to patient weight or concentration will recalculate volumetric rate but maintain dose rate.*
- *Drug names may be abbreviated if the name contains more than eight letters.*
- *Weight can only be entered in Kg's but is displayed in Kg's **and** Lbs. Weight units can be switched to grams by pressing ↓ to value of 1Kg then repressing ↓. A two tone advisory sounds.*
- *If dose measurement parameters and concentration measurement parameters are unrelated, a volumetric rate will not calculate. Attempts to start will display a prompt message: **Verify all dose settings.***
- *When a drug amount is 10,000 or greater, a **K** is used to replace 000th (i.e. 10,000 = 10K; 12,000 = 12K).*
- *If a recalculated dose results in a rate outside the rate ranges, a prompt message is displayed: **Rate too High, reenter value or Rate too Low, reenter value**.*
- *If a recalculated rate results in a dose outside the dose range, the channel will infuse at the entered rate but the dose will display the minimum or maximum allowable limit: (i.e. <0.1 or >999k).*
- *Secondary option cannot be used when the Dose Rate Calculator is enabled.*
- *If instrument is off for more than five minutes, the DRC mode will revert to the primary mode.*

Device

There are six Device Types with preset parameters that accommodate specific clinical applications. They are:

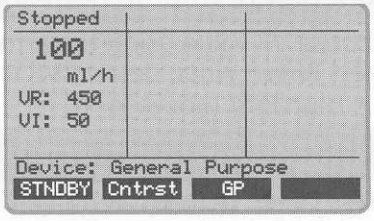
General Purpose	Operating Room
Neonatal	General Purpose II
Controller Pressure	Operating Room II

When setting up the pump, select the device type that best suits your clinical needs. the abbreviated name of the Device Type appears as a softkey on the Standard Display page. Pressing the softkey displays the device type in non-abbreviated form on the prompt line.

Maximum rate, maximum volume, pressure and air-in-line threshold are configured at the factory. See ***Table 1*** for a complete listing of preset parameters. Refer to the **Config** softkey section for programmable and configurable parameters.

These parameters can be modified to meet the institution's specific requirements using FMS software.

NOTE: The Device Type programming selection affects all three channels. It is not possible to program different Device Types for a channel independently.



To change Device Type

Press STANDARD DISPLAY.

Press MORE OPTIONS.

- **TotVol**, **Device**, **Config** and **Note** softkeys appear.

Press **Device** softkey.

- The currently selected Device Type has an asterisk and is highlighted.

Press **Select** to move the highlight through the list.

Press **Enter** when the desired device is highlighted.

If preset values are compatible with the newly selected device type,

- an asterisk appears next to the device name.

If channel is **not** infusing when device type is changed and preset values are **not** compatible with the newly selected device type,

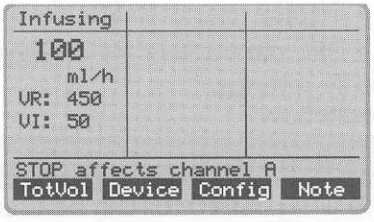
- The display switches to a notification screen.
- Incompatible Channel(s) indicated.
- Choice is given to continue.

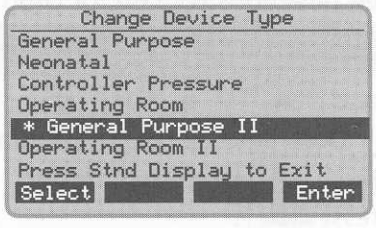
If **Yes**,

- Incompatible values are cleared.
- Display reverts to Standard Display Page.
- New Device Type becomes active.

If **No**,

- Display reverts to Change Device Type page.





If channel **is** infusing when device type is changed and preset values are **not** compatible with the newly selected device type,

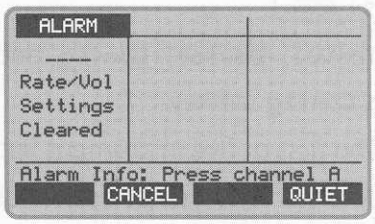
- The display switches to the notification screen.
- Incompatible Channel(s) is indicated.
- Choice is given to continue.

If **No**,

- Display reverts to Change Device Type page for user to select another device type.

If **Yes**,

- The pump will alarm.
- Infusion will stop on affected channel(s).
- Display reverts to Standard Display with Alarm indicated in affected channel.



Press affected channel [A], [B] or [C].

Follow instructions displayed.

Table 1

Default Parameter	General Purpose	Neonatal	Controller Pressure	Operating Room	General Purpose II	Operating Room II
Occlusion Detection Method	Baseline	Baseline	Absolute Threshold	Baseline	Baseline	Baseline
Occlusion Alarm Setting	Baseline+5 psi	Baseline+3 psi	3 ft H_2O	Baseline+5 psi	Baseline+5 psi	Baseline+5 psi
Maximum Pressure	15 psi	15 psi	3 ft H_2O	15 psi	15 psi	15 psi
Air-in-line Alarm Threshold	500 µl	50 µl	500 µl	500 µl	500 µl	500 µl
KVO Rate*	3 ml/h	1.0 ml/h	3 ml/h	3 ml/h	3.0 ml/h	3.0 ml/h
Rate Range	1 —999 ml/h	0.1—99.9 ml/h	1 — 299 ml/h	1 —999 ml/h	0.1—999 ml/h	0.1—999 ml/h
Maximum VR Setting	9999 ml	9999 ml	9999 ml	9999 ml	9999 ml	9999 ml
Pump Not In Use Advisory	Yes	Yes	Yes	No	Yes	No
ALL Setting for VR	N/A	N/A	N/A	Option	N/A	Option

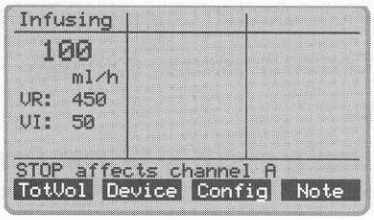
** Channel will infuse at the KVO rate shown in table or at the current infusion rate, whichever is lower.*

NOTE: Values shown in table can be modified to meet the institution's requirements using FMS software. To review actual default parameters on a MedSystem III DLE pump, select a Device Type and refer to Instrument Settings pages 2 through 5. An asterisk appears beside settings which are not factory default.

Config (Configuration)

The Config option allows the user to view and/or change some instrument settings. There are five pages in this option. Items shown on page 1 can be changed by the user (see Table 2). Pages 2 - 5 can only be changed by qualified personnel using FMS software.

To access Instrument Settings information



Press STANDARD DISPLAY.

Press MORE OPTIONS.

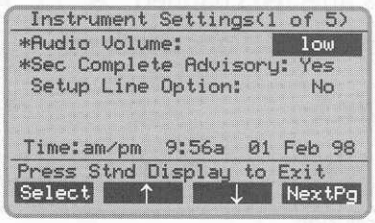
- **TotVol, Device, Config** and **Note** softkeys appear.

Press **Config** softkey.

- The first of five Instrument Settings pages is displayed.
- An asterisk indicates options that have been changed from factory settings.

Pressing **Select** moves the highlight through the list.

Press ↑ and ↓ to change a highlighted setting.



- **Select** softkey changes to **Enter** and **NextPg** softkey changes to **Recall** when a setting is changed.

Press **Enter** to accept new setting

OR

Press **Recall** to recall previous setting.

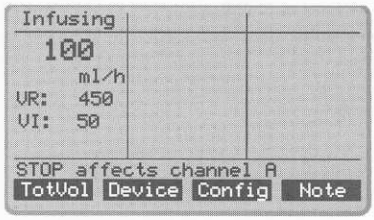
Press STANDARD DISPLAY to exit Instrument Settings page.

Table 2

Option	Choices	Description
Audio Volume	low medium high highest	A tone accompanies each level to aid in determining volume choice. If an alarm is ignored, the volume will ramp to the highest audio unless disabled by FMS. Factory default is "highest."
Sec Complete Advisory	Yes No	Pump sounds two tones and displays advisory when secondary VR = 0. Factory default is "No."
Setup Line Option	No Yes	Enables infusion to be set up as rate/volume or volume/time. Stop infusion before modifying this line option. Factory default is "No."
Time	24 hr am/pm	Allows pump to be set with a 12 or 24 hour clock. Factory default is "am/pm."
Hour/minutes	0000-2359	} Each item can be adjusted when highlighted.
Day	1-31	
Month	Jan-Dec	
Years	00-99	

Note

The Note soft key accesses the Special Note Message page. When a note is programmed, it appears when the pump is turned on.



To access Note(s)

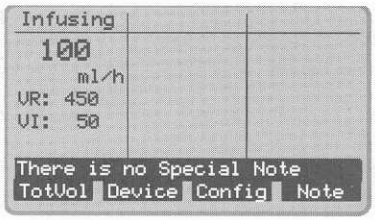
Press STANDARD DISPLAY.

Press MORE OPTIONS.

- **TotVol**, **Device**, **Config** and **Note** softkeys appear.

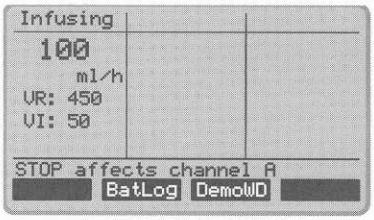
Press **Note** softkey.

- Note information is displayed.
- If no information has been programmed on the note page, there will be a two tone advisory and the message **There is no Special Note** will display on the prompt line.



BatLog (Battery History Log)

The BatLog softkey accesses the Battery History Log page. This page is provided for the Biomedical Engineering staff to review and record battery history data.



To access Battery History Log

Press STANDARD DISPLAY.

Press MORE OPTIONS twice.

- **BatLog** and **DemoWD** softkeys appear.

Press **BatLog** softkey.

- The Battery History page is displayed.

Press STANDARD DISPLAY to exit Battery History page

OR

- Display switches to Standard Display page after 1 minute.

Use this troubleshooting information in conjunction with appropriate hospital procedures.

Responding to an advisory, alarm, or fault message

Press **QUIET**.

- Audio tone stops.
- Red light flashes on affected channel.

Press affected channel (A), (B) or (C).

- Alarm Information page is displayed.

Take appropriate action(s) indicated on the display.

Press (START STOP) to resume infusion.

- Channel starts infusing.

Press (STANDARD DISPLAY)

OR

- Display reverts to Standard Display after one minute.

Verify settings.

Verify flow.

Alarm Response Keys

QUIET silences Advisories, Alarms, and Faults for two minutes. Softkey is accessible during alarm status.

NOTE: Channel's VR and VI values are updated with each press of ClrAir softkey.

CANCEL clears alarm and advisory messages and stops tone. Use when alarm or advisory condition cannot be corrected or user chooses not to correct.

NOTE: A ☑ appears on Standard Display page to indicate CONFIRM has been pressed.

ClrAir moves air bubbles past air-in-line sensor. Each press of the ClrAir softkey displaces approximately 0.2 ml of air/fluid. Three beeps indicate when air bubble is no longer in front of the air-in-line sensor.

CONFIRM is present during **Check Fluid Side** alarms. Allows infusion to continue if no upstream occlusion is found.

RETRY resets resumable fault conditions. Used when attempting to re-establish normal operation of a channel.

SERVICE disables use of affected channel. Once pressed, servicing of the pump is required before channel can be used.

Advisories

Two beeps, slow flashing red light on infusing channel's channel key; infusion continues.

	CORRECTIVE ACTION
Check Air Sensor At installation of cassette: a) air is detected in tubing; b) tubing collar is not properly seated; or c) air sensor is dirty or damaged.	• Verify tubing collar is fully seated in air sensor recess. • Verify tubing in air sensor recess is not damaged, twisted or dirty. • Press **ClrAir** on channel's Alarm Information page. Three beeps indicate air bubble is no longer in front of air sensor. • If air is still present, remove cassette and manually clear air according to hospital policy. • If no air is present, clean air sensor recess as directed in cleaning instructions.
Infusion Complete VR=0 VR has counted down to zero. Channel is infusing at KVO rate.	• Enter new VR or, if same volume is desired, press **REPEAT**. • Press **Enter**. • Press START STOP to resume primary infusion rate. • Verify fluid flow.
Low Battery 30 minutes or less battery power remaining.	• Connect AC adapter power cord to pump. • Plug into wall outlet.
Channel Not In Use Two minutes have elapsed since cassette was installed or infusion was stopped.	• Press **STNDBY** to place channel on Standby, OR • Press START STOP to start infusion, OR • Remove cassette.

Four rapid-beeps, infusion stops, rapidly flashing red light on channel key.

	CORRECTIVE ACTION
Air In Line Air detected in fluid pathway during infusion, or air sensor is dirty.	• Verify tubing collar is fully seated in air sensor recess. • Verify tubing in air sensor recess is not damaged, twisted or dirty. • Press **ClrAir** softkey on channel's Alarm Information page. Three beeps indicate air bubble is no longer in front of air sensor. NOTE: Each press of the ClrAir softkey displaces approximately 0.2 ml of air/fluid and updates channel's VR and VI values. • If air is still present, remove cassette and manually clear air according to hospital policy. • If no significant air is present, clean air sensor recess as directed in cleaning instructions. • Set up pump at or slightly below IV site to minimize formation of micro bubbles. • Press START STOP to resume infusion.
Air In Lower Tubing Air bubbles detected in fluid pathway with a total volume exceeding the air-in-line threshold setting. Possible outgassing and/or leaks in administration set.	• Check administration set for leaks. • Check lower tubing for multiple small air bubbles. • Press **ClrAir** softkey on channel's Alarm Information page. Three beeps indicate air bubble is no longer in front of air sensor. NOTE: Each press of the ClrAir softkey displaces approximately 0.2 ml of air/fluid and updates channel's VR and VI values. • If air is present, clear air according to hospital policy. • Set up pump at or slightly below IV site to minimize formation of micro bubbles. • If no significant air is present, press START STOP to resume infusion.
Battery Depleted Insufficient battery power. The pump will shut down in 5 minutes.	• Connect AC adapter power cord to pump and plug into wall outlet. • Press START STOP to resume infusion(s). **NOTE:** Drug List is lost if pump battery is totally depleted. Drug List can be reloaded into the pump with FMS software only.

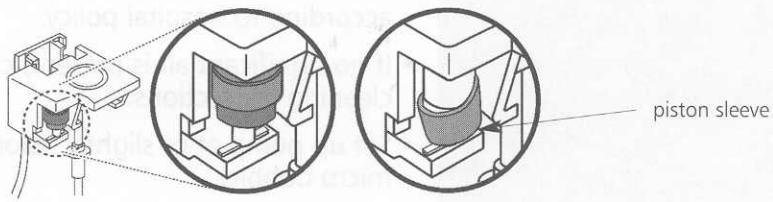
Four rapid-beeps audio, rapid-flashing red light and infusion stops.

CORRECTIVE ACTION

Cassette Jammed

Cassette piston is difficult to move or piston sleeve is loose.

- Remove cassette, check placement of soft, plastic piston sleeve and reposition, if necessary.
- If condition continues, try cassette in a different channel.
- Replace administration set if alarm recurs or if piston does not move freely.
- If alarm recurs with several cassettes, channel may need service.



CORRECT INCORRECT

Cassette Not Latched

Cassette is partially disengaged or latching mechanism is dirty.

- Push cassette completely in. Ensure slide clamp is flush with entire cassette. Press START STOP to resume infusion.
- If condition continues, try cassette in a different channel. Replace administration set if alarm recurs.
- Clean lower assembly according to cleaning instruction described in MAINTENANCE section of this document.

Cassette Removed

Cassette is removed from holder while channel is infusing.

- Reinstall cassette, and press START STOP to resume infusion

OR

- Press Cancel.

Check Fluid Side

Possible upstream restrictions to flow.

- Check tubing between container and pump for a closed regulating clamp, closed vent (with unvented container), kinked tubing, empty syringe, or any restriction to flow.
- If NO occlusion is present, press CONFIRM.
- Press START STOP to resume infusion.
- Verify fluid is flowing in drip chamber.
- A ☑ appears on standard display to indicate Confirm has been pressed.

Four rapid-beeps audio, rapid-flashing red light and infusion stops.

CORRECTIVE ACTION

Faulty Cassette

Cassette may be damaged or inoperable. Possible malfunction of cassette sensor located in holder.

- Reinsert cassette in another channel.
- If alarm recurs in second channel, replace administration set.
- If alarm recurs with two cassettes in the same channel, discontinue use and contact qualified service personnel.

Fluid-Side Occluded

Upstream restriction to flow.

- Check tubing between container and pump for a closed regulating clamp, closed vent (with unvented container), kinked tubing, empty syringe, or any restriction to flow.
- Clear occlusion.
- Press START STOP to resume infusion.
- Verify fluid is flowing in drip chamber.

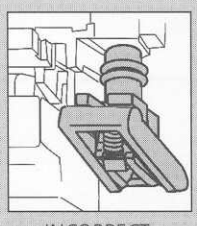
Patient-Side Occluded

Downstream restriction to flow.

- Check tubing between pump and patient for kinks, closed clamps, closed stopcocks, clogged filters, site problems, etc.
- Clear occlusion or change infusion site.
- Press START STOP to resume infusion.
- Verify fluid is flowing in drip chamber.

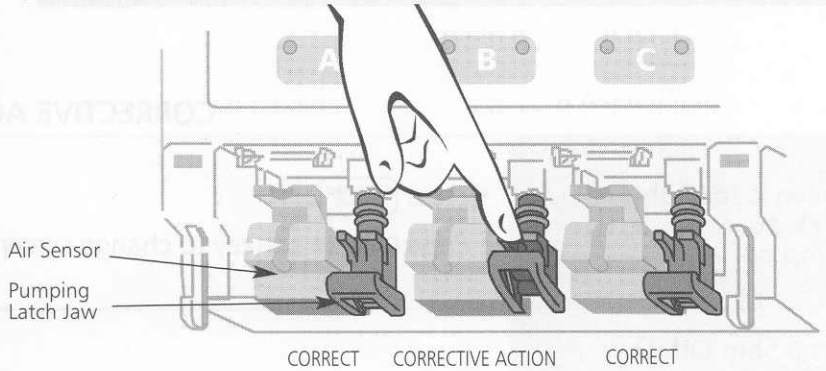
Pumping Latch Closed

Pumping latch jaw located to right of air sensor is closed or broken.



INCORRECT

- Using only your finger, push down pumping latch jaw until it snaps open.
- If pumping latch jaw is visibly broken, contact qualified service personnel.



CORRECT CORRECTIVE ACTION CORRECT

Rate/Vol Settings Cleared

Rates and/or volumes are incompatible with newly selected Device Type.

- Re-enter settings as required.
- Press START STOP to resume infusion.

Fault

Numeric message, European siren, rapid-flashing red light, infusion stops.

	CORRECTIVE ACTION
Channel Out of Order Safety checks built into software have detected a faulty channel. **Fault Number** Safety checks built into software have detected a fault condition.	CORRECTIVE ACTION for resumable faults only. • Press affected channel (A), (B) or (C). • Follow instructions on channel's Alarm Information page. • Press **RETRY** to clear fault. • If fault recurs, press **SERVICE** and contact qualified service personnel.

Watchdog

Blank screen, continuous tone red and green lights continuous, all infusions stop.

	CORRECTIVE ACTION
Blank Screen Safety checks built into software have detected an instrument error condition.	Attempt to reset pump: • Turn pump off, then on again. • Press (START STOP) to resume each channel that had been infusing. • If Watchdog alarm recurs or pump cannot be turned on, replace pump and notify qualified service personnel.

Other Conditions

	CORRECTIVE ACTION
Screen is too light or dark to read with pump on.	• Press (STANDARD DISPLAY). • Press **Cntrst** softkey to change screen contrast.
Pump Shut Off: Low Power. Pump shut down after a Battery Depleted alarm had not been corrected.	• Connect AC adapter cord to pump and plug into wall outlet. • next to External Power receptacle is lit green when AC power is properly applied.

Specifications

STANDARDS	UL 544, CSA C22.2, No. 125
CASE MATERIAL	Impact resistant polycarbonate/ABS alloy
DIMENSIONS	Height 7.875 inches (20.00 centimeters) Width 6 inches (15.24 centimeters) Depth 2.10 inches (5.33 centimeters)
WEIGHT	Approximately 5.1 pounds (2.3 kilograms) including pole clamp
AIR-IN-LINE (DEFAULT)	500 μl (except for Neonatal device type which is 50μl)
OCCLUSION PRESSURE (DEFAULT)	15 psi except for Controller Pressure device type which is 3 ft H_2O
OPERATING TEMPERATURE	50-104° Fahrenheit (10° - 40° Celsius)
TRANSPORT/STORAGE TEMPERATURE	-4 to +131° Fahrenheit (-20 to + 55°C) (<95°F or 35°C for optimum battery life)
RATE RANGE	0.1 - 999 milliliter per hour (each channel)
VOLUME RANGE	0.1 - 9999 milliliter (each channel)
KVO RATE RANGE	0.1 - 20.0 milliliter per hour
RATE ACCURACY:	1.0 - 999 ml/hr ±5% with a standard deviation of 1.96 under specified conditions.* 0.1 - 0.9 ml/hr ±10% with a standard deviation of 1.96.
ADMINISTRATION SETS	Use only MedSystem III Administration Sets
POWER CONSUMPTION	6 watts AC power. Use only MedSystem III AC Adapter, Model 1555 or 1550.
BATTERIES	Main – Rechargeable NiCd Battery Pack Memory Back-up – Nonrechargeable Lithium

NOTE: Use only approved Alaris Medical Battery Packs.

BATTERY CHARGE	A fully charged battery has a minimum of 6 hours running time with all channels running at 125 milliliters per hour and backlight usage of 2 minutes per hour. The main battery retains 80% of its capacity after 500 charging cycles, and retains 90% of its capacity after 3 months of continuous AC charging.

NOTE: Replacement of both the main and memory backup batteries must be performed by qualified service technicians.

AC ADAPTER & CORD LENGTH	Model 1555, 7.5 Vdc @ 1 Amp with 10 ft cord. Model 1550, 8.5 Vdc @ 750 mA with 8.5 ft. cord.
FUSES	3 amp fast-blow internal
GROUND CONTINUITY	Maximum 0.1 ohm
LEAKAGE CURRENT	Maximum 100 microamps

** Long-term accuracy specified, per IEC 60601-2-24, under the following conditions:*

Head height: . . . . . *30"*
Test solution: . . . . . *Distilled water*
Environmental: . . . *Ambient temperature*
Back pressure: . . . . *18 gauge needle*
IV set: . . . . . *Model 28034*

Cleaning

Clean the pump regularly to maintain proper working order and optimum performance.

WARNING: *To avoid electrical hazard, always disconnect AC adapter power cord from the wall outlet before cleaning the pump.*

CAUTIONS:

- Do not allow cleaning solutions to enter the pump's case housings.
- Do not spray any solution into any part of the pump.
- Do not invert the pump during cleaning or rinsing.
- Do not immerse the pump.
- Never clean the pump without first inspecting the condition of the housings for damage.
- Do not steam, autoclave, or EtO gas sterilize the pump.
- Do not use pressurized air to dry the pump, as the force may move fluid past the moisture seals.
- Do not use organic solvents, ammonia, ammonium-based agents, and/or abrasive cleansers.
- Take care not to damage valve actuators.
- Never use sharp or metallic tools to remove residue.

Before Cleaning

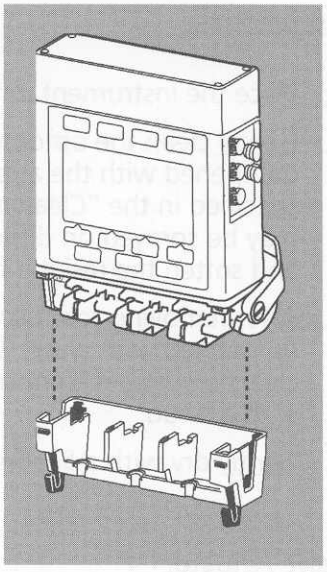
1. Unplug the AC adapter power cord from the wall outlet.
2. Disconnect the power cord from the external power connector, on the side of the pump.
3. Inspect the pump's outside surfaces for damage.
   - Any cracks or punctures may allow fluid to enter.

NOTE: If the power cord is permanently attached to the pump, ensure cleaning solution does not enter the connector.

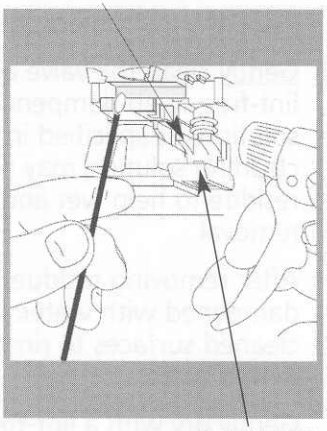
To Clean

For cleaning applications:

- use solutions of non-abrasive, non-staining detergent (i.e., commercially available, alcohol-free, dishwashing liquid) well diluted with warm water
- rinse with distilled or de-ionized water
- use soft, non-abrasive cloths, soft-bristled brushes and/or non-abrasive, lint-free swabs.



SLIDE LINK ASSY.



PUMP LATCH

The Pump, lower housing, slide link and latch

1. Wipe the pump exterior using a cloth dampened with cleaning solution.
2. Remove the lower housing to access the pump's lower assembly by pressing all four black, release tabs simultaneously while pulling straight down.
3. Set the pump upright.
4. Clean the slide link and pump latch mechanism using a small soft-bristled brush (or lint free swab) dampened with the appropriate cleaning solution, as specified in the "Cleaning" section. If dried residue is difficult to remove, or the slide link or pump latch sticks, spray the cleaning solution on the residue and allow it to soak until it can be more easily removed.
5. After removing residue, rinse with a lint free swab dampened with water. Water may be sprayed on the cleaned surfaces to rinse areas that are difficult to reach with a swab.
6. Dry with a lint-free swab or cloth, or allow to air dry.

Air Sensor Recess

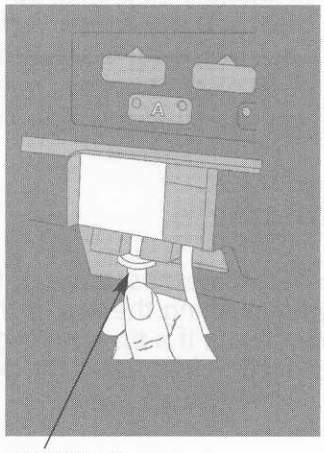
> NOTE: Air-in-line alarms may occur when dries residue builds up in the air-in-line sensor tubing recess.

1. Inspect the air-in-line sensor module to ensure that there is no separation or breakage of the glued seams.

> NOTE: Defective air-in-line sensor modules must be replaced before using the instrufment.

2. Place the instrument in the upright position.
3. Clean the tubing recess (using a downward motion) with a lint free swab dampened with the appropriate cleaning solution, as specified in the "Cleaning" section.

CAUTION: *Use of abrasives or abrasive cleaners on air sensor recess may cause false Air-in-line or Check Air Sensor alarms.*



AIR SENSOR

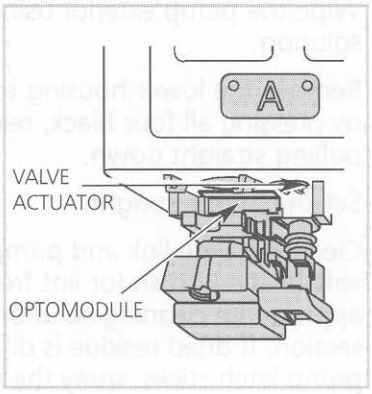
4. Rinse with a lint free swab dampened with water.
5. Dry with a lint-free swab or allow to air dry.

Optomodule

1. Place the instrument in the upright position.
2. Gently clean the optomodule using a lint-free swab dampened with the appropriate cleaning solution, as specified in the "Cleaning" section. The cleaning solution may be sprayed on difficult-to-remove residue to help wet and soften the residue for easier removal.
3. After removing residue, gently rinse with a lint-free swab dampened with water. Water may be sprayed on the cleaned surfaces to rinse areas that are difficult to reach with a swab.
4. Gently dry with a lint-free swab or allow to air dry.

WARNING: *When cleaning the optomodule use EXTREME CARE to avoid damage to valve actuators. Damage or breakage of the actuator tips could cause an uncontrolled flow condition.*

CAUTION: *Do not use isopropyl alcohol or chlorine water on the optomodule.*

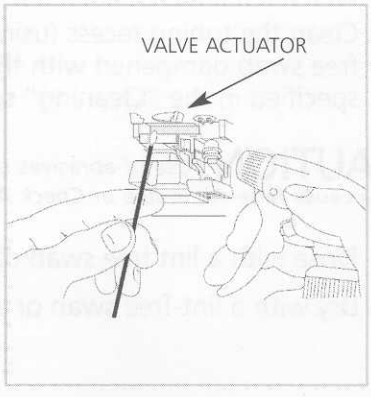


Valve Actuator

1. Place the instrument in the upright position.
2. Gently clean the valve actuator and actuator seal using a lint-free swab dampened with the appropriate cleaning solution, as specified in the "Cleaning" section. The cleaning solution may be sprayed on difficult to remove residue to help wet and soften the residue for easier removal.
3. After removing residue, gently rinse with a lint-free swab dampened with water. Water may be sprayed on the cleaned surfaces to rinse areas that are difficult to reach with a swab.
4. Gently dry with a lint-free swab or allow to air dry.
5. After cleaning, inspect the exposed tips of the valve actuators. A broken tip may be supported by the actuator seal and not appear defective. Lightly attempt to push the tips of the valve actuators from side to side with a dry lint-free swab. If a tip is not rigid, then it is broken and must be replaced before using the instrument.

WARNING: *Care must be taken when cleaning the vicinity of the valve actuators to avoid damage and breakage of the actuator tips. Damage or breakage of the actuator tips could cause an uncontrolled flow condition.*

CAUTION: *Do not use isopropyl alcohol to clean the valve actuators.*



After cleaning

Inspect the exposed tips of the valve actuators for damage by lightly pushing the tips of the valve actuators side-to-side with a dry swab. If a tip is not rigid, it is broken and must be replaced before using the pump.

Inspection Requirements

To ensure the pump remains in good operating condition, both regular and periodic inspections are required. Any instrument that does not meet listed specifications should be serviced.

Regular inspections consist of performing the procedures described in the Basic Operation and Cleaning sections of this manual before use of the pump. Regular inspections are not covered under any contract or agreement offered by ALARIS Medical Systems, Inc., and must be performed by the user.

WARNING: *Failure to perform these inspections may result in improper instrument operation.*

When programming infusions verify that the display:

- Is complete and not blurred;
- Reads the same as described in this manual;
- Responds with the intended function for that key press.

NOTE: Detailed instructions for performing periodic inspections and maintenance can be found in the Technical Service Manual for the IVAC MedSystem III Multi-Channel Infusion Pump and in supplemental service bulletins.

Periodic inspections must be performed every 12 months. A service agreement may be obtained from ALARIS Medical Systems, Inc., for the performance of all required periodic inspections.

The periodic inspections must be performed in accordance with ALARIS requirements and guidelines. Customers within the United States and Canada should note that these inspections are also intended to complement the intent of Joint Commission on the Accreditation of Healthcare Organizations requirements.

Service Information

If the instrument fails to respond as described in this manual and the cause cannot be determined, do not use the instrument. Contact qualified service personnel.

Within the United States, application and service information may be obtained by writing to the ALARIS Medical Customer Service Department at:

ALARIS Medical Systems, Inc.
ATTN: Customer Service
10221 Wateridge Circle
San Diego, California 92121

Within the United States and Canada, a toll-free telephone number has been set up for your convenience.

For information or assistance, or to arrange return of the instrument for repair:

In the United States - **(800) 482-4822**
In Canada - **(604) 241-0911** *or* **(800) 513-2254**

For clinical or technical support, call:

(800) 854-7128 *or* ***(619) 458-6003***

Outside the United States and Canada, service information, applications, and manuals may be obtained by contacting your local ALARIS Medical Service Department or distribution center.

When submitting a request for service, include:

- a description of the difficulty experienced
- instrument settings
- administration set model and lot number
- solution used
- message displayed at the time of difficulty

If it is necessary to return the instrument for service, obtain a return authorization prior to shipment. Carefully package the instrument (preferably in the original packaging), reference the return authorization information, and return it to the appropriate service or distribution center. ALARIS Medical cannot assume any responsibility for loss of or damage to instruments while in transit to ALARIS Medical.

WARRANTY

ALARIS Medical Systems, Inc., (hereinafter referred to as ALARIS Medical) warrants that:

A. *Each new ALARIS Medical instrument excluding the battery is free from defects in material and workmanship under normal use and service for a period of one (1) year from the date of delivery by ALARIS Medical Systems to the original purchaser.*

B. *The battery and each new accessory are free from defects in material and workmanship under normal use and service for a period of ninety (90) days from the date of delivery by ALARIS Medical Systems to the original purchaser.*

If any product requires service during the applicable warranty period, the purchaser should communicate directly with ALARIS Medical Systems headquarters (San Diego, CA) to determine the appropriate repair facility. Except as provided otherwise in this warranty, repair or replacement will be carried out at ALARIS Medical Systems' expense. The product requiring service should be returned promptly, properly packaged and postage prepaid by purchaser. Loss or damage in return shipment to the repair facility shall be at purchaser's risk.

In no event shall ALARIS Medical Systems be liable for any incidental, indirect or consequential damages in connection with the purchase or use of any ALARIS Medical Systems product. This warranty shall apply solely to the original purchaser. This warranty shall not apply to any subsequent owner or holder of the product. Furthermore, this warranty shall not apply to, and ALARIS Medical Systems shall not be responsible for, any loss or damage arising in connection with the purchase or use of any ALARIS Medical Systems product which has been:

(a) *repaired by anyone other than an authorized ALARIS Medical Systems service representative;*

(b) *altered in any way so as to affect, in ALARIS Medical Systems judgment, the product's stability or reliability;*

(c) *subjected to misuse, or negligence, or accident, or which has had the product's serial or lot number altered, effaced or removed;*

or

(d) *improperly maintained or used in any manner other than in accordance with the written instructions furnished by ALARIS Medical Systems.*

This warranty is in lieu of all other warranties, express or implied, and of all other obligations or liabilities of ALARIS Medical Systems, and ALARIS Medical Systems does not give or grant, directly or indirectly, the authority to any representative or other person to assume on behalf of ALARIS Medical Systems any other liability in connection with the sale or use of ALARIS Medical Systems products.

ALARIS MEDICAL SYSTEMS DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE OR APPLICATION.

See packing inserts for international warranty, if applicable.

1° Pri	Primary infusion
2° Sec	Secondary infusion
a	am
AAMI	American Association of Medical Instrumentation
ABS	acrylonitrile-butadiene-styrene
AC	alternating current (electrical power)
BatLog	Battery History Log
Calc	Calculator
CalcOff	Calculator Off
CalcOn	Calculator On
ClrAir	Clear Air
Cntrst	Contrast
COMM	Communications Port
Conc	Concentration
Config	Configuration
CP	Controller Pressure
CSA	Canadian Standards Association
DemoWD	Demonstrate Watchdog
DI	Dose Infused
ECG	Electro-cardiogram
ES	Electro-static
FMS	Field Maintenance Software
Gm	gram
GP	General Purpose
GP II	General Purpose II
h	hour
Hz	Hertz
in.	inch
I.D.	identification
IEC	International Electrotechnical Commission
Inf	infused
IV	intravenous
JCAHO	Joint Commission on the Accreditation of Health Care Organizations
K	1,000 for numbers 10,000 or greater
KG; kg	kilogram
KVO	keep vein open
LB; lb	pound
mcg	microgram
mEq	milliequivalent
mg	milligram
min; mn	minute

ml	milliliter
mMol	millimole
mUn	milliunit
µl	microliter
N/A	not applicable
Neontl	Neonatal
NextPg	Next Page
Ng	Nanogram
NiCd	nickel-cadmium
OR	Operating Room
OR II	Operating Room II
p	pm
Pri	Primary
psi	pounds per square inch
Sec	Secondary
Stnd Disp	Standard Display
STNDBY	Standby
TotVol	Total Volume
TR	time remaining
UL	Underwriters Laboratories, Inc.
Un	unit
V	Volts
VI	volume infused
Vol	volume
VolRem	volume remaining
VR	volume remaining
Wt	weight

Symbols

	Refer to accompany documents for complete instructions.
	Canadian Standards Association
	Underwriters Laboratories
	Plug
	Direct Current

Corporate Office:
10221 Wateridge Circle
San Diego, California 92121-2733
Mail: P.O. Box 85335
San Diego, California 92186-5335

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