CURLIN® 8000 Ambulatory Infusion Pump
BY MOOG


# USER MANUAL

For use with the CURLIN 8000
Ambulatory Infusion Pump

MOOG®

Enhancing Healthcare.
Enriching Lives.™

# CURLIN® 8000
# Ambulatory Infusion System
# User Manual

Rev. F

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# Chapter 1. Introduction

Clinical and pharmacy personnel “clinicians” can use this manual, along with training, to learn how to program and use the Moog CURLIN® 8000 Ambulatory Infusion System (“CURLIN 8000” or “pump”) to deliver infusions to a patient.

**Warning** Failure to read and understand this entire CURLIN 8000 User Manual could result in critical or serious patient harm.

## CURLIN 8000 Description

The Moog CURLIN 8000 Ambulatory Infusion System is an easy-to-use, multi-function ambulatory infusion pump, which delivers a broad range of medications and fluids. It operates accurately in any position and has an average flow rate resolution of two micro-liters or less per bolus. Its compact, lightweight design allows mobility for patients.

The CURLIN 8000 can be:

- Stored and transported in a carrying pack, e.g., backpacks, side packs
- Mounted to a pole
- Placed into a lockbox
- Set on a suitable surface for use

Clinicians can program an infusion program into the pump using the keypad, called “Basic Programming”. Basic Programming is covered in this user manual. Additionally, pharmacists can program the pump using the Dose Error Reduction Software (DERS), CURLIN RxManager™. This software allows the pharmacist to create Patient Specific Protocols (PSPs) on a laptop or network computer, to be uploaded directly to the CURLIN 8000 pump. Using a PSP to deliver an infusion is covered in this manual.

Features available when programming through the RxManager are clinical advisories, which display on the pump, custom drug and fluid lists, protocol templates, and the ability to set dosing limits. The RxManager is intended to help reduce programming errors and enhance the clinician’s workflow. For more information on the RxManager, see the CURLIN RxManager Enterprise Solution Software User Manual.

For patent information, visit www.moogmedical.com/patents.

**WARNING:** This product can expose you to chemicals including Polyvinyl chloride, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

## Intended Use and Environment

### Intended Use

The CURLIN 8000 ambulatory infusion system is intended for use on adult and pediatric patients in Home Care and Clinical settings to provide the infusion of a broad range of fluids and medications. The pump will provide infusion delivery through accepted clinical routes of administration.

For Home Care settings this includes:

- intravenous
- subcutaneous
- epidural
- perineural

For Clinical (non-home care) settings this includes:

- intravenous
- intra-arterial
- subcutaneous
- epidural
- perineural

### Intended Use Environment

Home Care setting where the infusion pump is managed by the patient/caregiver:

- Residential home

Clinical settings where the infusion pump is managed by a clinician, such as:

- Ambulatory Infusion Suite (AIS)/Ambulatory Infusion Center (AIC)
- Post-acute Rehabilitation Centers and Long-Term Care facilities
- Acute Care

### Indications For Use

The CURLIN® 8000 ambulatory infusion pump system is indicated for use in home care and clinical settings for the controlled administration of prescribed medical fluids through clinically accepted routes of administration: intravenous, intra-arterial, subcutaneous, epidural, and perineural, to adult and pediatric patients. The pump is intended to deliver a variety of therapies (drugs and fluids) which have been approved for these routes of administration. Examples of the therapies, which may be delivered using the CURLIN® 8000 pump, include hydration, parenteral nutrition, anti-infectives, pain management, inotropes, chemotherapy, immune globulin, and biologics. The CURLIN 8000 is not indicated for the delivery of cellular blood products.

RxManager Enterprise Solution Software allows the user to create and manage pump configurations and therapy-based protocols to be used with the CURLIN 8000 Ambulatory Infusion Pump.

CURLIN Administration Sets are intended to be used with CURLIN infusion pumps to deliver medication from a container to a patient.

## Therapy Modes

The CURLIN 8000 features five therapy modes:

| Therapy Mode: | Description: | For More Information, See: |
|---|---|---|
| Continuous Infusion | Allows a constant, programmed rate of infusion for a programmed volume and duration. | Chapter 5, Continuous Therapy Mode, p. 46 |
| PCA (Patient Controlled Analgesia) | Allows a continuous rate of infusion and/or patient-controlled demand boluses. Also allows clinician boluses. Used for pain management. | Chapter 6, PCA Therapy Mode, p. 53 |
| TPN (Total Parenteral Nutrition) with Automatic Ramping | Allows a constant rate of infusion of parenteral nutritional products with the option of tapering at the beginning, and/or end of the infusion. | Chapter 7, TPN Therapy Mode, p. 63 |
| Intermittent Delivery | Allows a specified dose to be delivered at repeating intervals for a specified number of doses. An optional KVO (keep vein open) rate may be programmed to be delivered between doses to maintain catheter patency. | Chapter 8, Intermittent Therapy Mode, p. 69 |
| Variable Program | Allows up to 24 steps to be programmed, where each step contains a specified dose amount, rate, and dose duration. | Chapter 9, Variable Therapy Mode, p. 77 |

**Warning** For patients on life-sustaining therapies, Moog recommends having a backup pump available, using fully charged disposable C-Cell batteries or the rechargeable battery pack, and using the external AC adapter to connect the pump to an external AC power outlet for uninterrupted infusion.

## Regulatory Agency Approvals

The Moog CURLIN 8000 Infusion pumping system (with its associated accessories and administration sets) has been evaluated by an independent authorized lab and found to be compliant with the following international standards:

- IEC 60601-1 Basic Safety
- IEC 60601-1-2 - EMC
- IEC 60601-1-11 – Home Health care
- EN 60601-2-24 – Infusion pumps

## Warnings, Cautions and Notices

Infusion pumps can experience electrical breakdowns, design faults, or human error. Human error can include providing the wrong dose, administering the wrong medication, or incorrectly programming the pump such as entering the wrong drug, rate, or concentration. Infusion site reactions may include pain, abnormal redness of the skin, swelling, or infection. It is important to read and understand all warnings, cautions and notices.

### Warnings

Failure to read and understand this entire CURLIN 8000 User Manual could result in critical or serious patient harm.

Failure to train clinicians and caregivers regarding the care, use and maintenance of the pump and accessories may result in critical or serious patient harm.

Visually inspect the CURLIN 8000 and pumping chamber before use:

- Do not use the CURLIN 8000 if it has been dropped.
- Do not use the CURLIN 8000 if it appears the pump has been tampered with. If the pump has been tampered with or it has been dropped, return the CURLIN 8000 to the provider, e.g., the pharmacy, contracted distributor, or Moog Medical.

If the settings on your pump do not match the medication order, call the patient's health care provider before starting the infusion.

Do not leave the CURLIN 8000 unattended while unlocked. All programming functions are accessible while the CURLIN 8000 is unlocked.

Do not open or modify the CURLIN 8000. Unauthorized opening or modification may result in pump malfunction and serious patient harm.

The CURLIN 8000 is NOT safe for use in an MRI environment. The CURLIN 8000 should not enter the MRI scanner room. The device presents a projectile hazard.

Do not submerge the pump or place the pump under running water when connected to external AC power. This may lead to electric shock or damage to the pump.

To avoid potential fire hazard, do not use the pump near flammable anesthetics, explosive gases or in an oxygen rich environment such as Hyperbaric Oxygen Therapy. Note: Use with supplementary oxygen and ventilation is allowed.

When administering life sustaining therapies, Moog recommends having a plan in place which addresses emergencies such as: pump malfunction, power loss, administration set failures, and issues with the drug. These plans should include the provision of back-up pumps and power sources. While it is not necessary to keep the CURLIN 8000 pump plugged into AC power, it is recommended that an AC power adapter be provided to these patients as a back-up power source.

When the infusion is not being monitored, such as during the night, patients in the home should consider plugging the pump into AC power in addition to use of the C-Cell or rechargeable batteries.

Do not disclose pump access codes or any information that would allow the patient or unauthorized clinician complete access to programming and operating functions.

Do not permit the patient or an unauthorized clinician to become familiar with the procedure for giving a clinician bolus. Improper or unauthorized programming or delivery of the clinician bolus could result in serious patient injury or death.

Only the patient may use the PCA bolus handset and BOLUS button on the CURLIN 8000. If anyone other than the patient initiates a PCA bolus, it may cause the patient to receive too much medication that could result in serious patient injury or death.

Do not use the CURLIN 8000 with a pressure cuff connected to the IV bag or medication reservoir bag and do not improperly squeeze or compress the bag during infusion. This could result in over-infusion, and possibly damage the pump.

Adhere to any warnings, precautions, or recommendations stated by drug manufacturers regarding the use of infusion pumps and disposable administration sets in the administration of their specific products.

Administer all drugs in accordance with the indications included in the manufacturer's package insert accompanying the drugs including, but not limited to, use of approved routes of delivery.

Use only approved CURLIN administration sets. The 340-XXXX series of CURLIN Administration sets cannot be used in the CURLIN 8000 pump. The use of non-CURLIN administration sets could result in air infusion, under delivery, over delivery or free flow, and could result in patient harm.

Visually inspect the administration set before use:

- Do not use administration sets that are damaged or appear to be tampered with.
- Do not use if package seal is broken, if the caps are removed from the tubing, if the white slide clamp(s) is closed, or if the break-away tab is missing from the yellow flow-stop.
- Do not use the administration set beyond its recommended life or beyond its use by date.

Always read and follow specific instructions for use provided with the administration set.

Maintain safe clinical practice and always close the slide clamp on the administration set before removing the administration set from the pump to prevent over-delivery of medication.

Never prime the administration set while it is connected to the patient. Before connecting the administration set to the patient, check to see if the administration set has been primed and all the air is removed. Failure to properly prime could result in patient injury.

Never touch either uncapped end of the administration set (the spike or Luer) or allow either end to touch any surface. Doing so may contaminate the set and put the patient at risk for developing an infection. While priming the set, keep the blue cap on the Luer to maintain its sterility.

The administration set contains small parts such as caps, which could be a choking hazard. Keep all small parts away from children.

Avoid leaving tubing and cords where infants, children, or those deemed at high risk for medical line entanglement, can become entangled. Be aware that if these items become wrapped around a patient's neck, there is an increased risk of strangulation or death. Caregivers of patients who are at risk for entanglement should discuss with their health care provider how to properly manage their lines and properly monitor patients based on their needs while in use.

If using tape to secure the administration set to the patient, do not place tape over the 0.2 or 1.2 micron filter. This could block the filter vent and prevent it from working properly leading to improper medication delivery. (Refer to the administration set pouch to determine if your set contains a filter).

If your administration set includes an in-line 0.2 or 1.2 micron air eliminating filter, avoid raising the filter above the height of the patient's catheter entry point while infusing. The catheter entry point is the location on the patient's body where the IV catheter is inserted. Raising the filter up above this height can cause the filter contents to drain into the patient causing unintentional delivery of medication.

Make sure the external AC power cord plug is completely dry before and during use. Failure to do so may result in electric shock.

Monitor the IV site (catheter location) frequently. If any signs or symptoms of infiltration or inflammation are noted at the infusion site, stop the infusion and report it to the health care provider.

Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the CURLIN 8000 Ambulatory Infusion System, including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result.

Use of this equipment adjacent to or stacked with other equipment should be avoided because it could result in improper operation. If such use is necessary, this equipment and the other equipment should be observed to verify that they are operating normally.

Use of accessories, transducers and cables other than those specified or provided by the manufacturer of this equipment could result in increased electromagnetic emissions or decreased electromagnetic immunity of this equipment and result in improper operation.

## Cautions

Before use, patients and caregivers must be educated on the use of the CURLIN 8000 pump, accessories, and administration sets by a qualified health care provider. A qualified health care provider should monitor the patient throughout the use of the pump.

The pump has an infusion accuracy of +/- 5% at all flow rates above 1 mL/hr, under nominal operating conditions (see “Factors Impacting Infusion Accuracy in Ch. 17). Consider the system accuracy and priming volume needs when determining how much overfill to include in the IV bag. Failure to do so may result in the bag volume running out before the completion of the infusion program.

At rates below 1 mL/hr the infusion accuracy of the CURLIN 8000 can vary by as much as 15%. Use of air eliminating filters below 1 mL/hr can result in under delivery variation up to -18%. For infusions requiring higher accuracy at flow rates below 1 mL/hr, use of an alternate delivery method should be considered.

The CURLIN 8000 is partially fluid-resistant and can withstand fluid spillage within limits. However, the CURLIN 8000 will not withstand total submersion. Moisture buildup within the case could cause damage to the operating components.

To prevent malfunctions, press the On/Off button to power off the pump. Do not remove the power source before powering off the pump.

Batteries should be installed in the pump even when running on the external AC adapter. Use only the rechargeable battery pack or approved disposable C-Cell batteries.

Do not short circuit, crush, heat above 80°C, incinerate, or disassemble the rechargeable battery.

Use only approved cleaners and cleaning methods. Using unapproved cleaners or cleaning methods can damage the screen, keypad, and case, resulting in an illegible screen, unusable keypad, and degradation of the case.

Lock level setting “OFF” should be reserved only for situations where a clinician is present and monitoring the pump for the entire infusion.

Use only fingertips to press the keypad buttons. Do not use sharp objects, which will damage the keypad.

Do not operate the pump outside of the specified temperature range. Doing so can affect the accuracy of medication delivery. Refer to pg. 182 for appropriate temperature ranges.

The CURLIN 8000 has not been tested for operation in an aircraft.

The CURLIN 8000 is indicated for multiple delivery routes. However, not all routes are applicable or appropriate for all settings. Selection of appropriate routes of delivery for home use is important. Some routes require full time clinical management and monitoring and are not appropriate for the home setting (see Table 17-1). Carefully consider the expected patient/caregiver interactions with the pump when a clinician is not present. Drugs and solutions must be delivered into routes indicated for per the drug/solution labeling.

When possible, bring the medication/solution to room temperature prior to starting the infusion to minimize Air In Line alarms.

Administration of drugs with this pump is limited by the drug's indication for use, as well as all warnings, precautions, and contraindications.

The CURLIN 8000 has not been evaluated for the delivery of cellular blood products.

Do not stretch the tubing of the administration set or leave the tubing in the CURLIN 8000 for more than 24 hours when the pump is not running.

Do not use administration set if it is beyond recommended life or use by date found on outside of set packaging. Pump performance may be affected when exceeding the recommended duration of use.

Only use accessories recommended by Moog Medical. Use of non-recommended accessories may adversely affect the CURLIN 8000's operation

Do not overload carry packs with personal items as pump function may be affected by kinked or pinched tubing and/or unintentional button presses.

## Notices

U.S. federal law restricts this device to sale by or on the order of a physician or other licensed practitioner.

The CURLIN 8000 is a Class II medical device. The mode of operation is continuous, and is defibrillation proof (Type CF applied parts).

The CURLIN 8000, administration sets, and accessories are not formulated with natural rubber latex.

Comply with state and local ordinances for the proper disposal of used batteries, reservoir, extension sets, other used accessories and the CURLIN 8000 when they have reached the end of their useful life.

Use only non-rigid, non-vented IV fluid containers unless an administration set with a vented spike is used and the container is suspended from an IV pole.

Do not use the HIGH SENSITIVITY occlusion setting on the CURLIN 8000 when using with an administration set that contains an Anti-Siphon Valve (ASV).

The administration of medications into the epidural space is limited to delivery via specially designed indwelling catheters inserted by a qualified physician. Any patients receiving epidural infusions should be managed and monitored by medical professionals familiar with epidural administrations and their clinical management. Moog Medical offers administration sets specifically designed for epidural infusions with 0.2 micron filters, no injection ports, and yellow striping to clearly identify the set for epidural use. Any administration set being used for epidural infusions should be clearly labeled as such.

Residual risks have been reduced as far as possible without adversely affecting the benefit-risk ratio. After considering the CURLIN 8000 Pump System risk assessments and the medical benefits of the product, the overall residual risk (the totality of the individual residual risks including side effects and usability) is considered to be acceptable.

⚠ **WARNING:** This product can expose you to chemicals including Polyvinyl chloride, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

## Symbols

| Symbol | Definition |
|---|---|
| MD | The CURLIN 8000 is a medical device |
|  | This user manual is available in electronic format |
|  | Manufacturer |
| EC REP | Authorized Representative in the European Community |
| STERILE EO | Sterile<br>Administration set sterilized by ethylene oxide |
|  | Keep Dry |
|  | Do not use Administration Set (tubing) if package damaged |
| SN | Serial Number |
| LOT | Manufacturing Lot |
| VOL | Administration Set priming volume |
| P | Professional Use only |
| CE 0123 | CE Mark |
| REF | Catalog number |
|  | Storage temperature with temperature limits |

| Symbol | Definition |
|---|---|
|  | Storage pressure, store pump within pressure limits |
|  | Storage humidity, store pump with humidity limits |
|  | Administration sets are non-pyrogenic |
|  | Do not reuse the administration set (tubing) |
|  | Use by date |
|   | Prescription Only.<br>Caution: Federal law restricts this device to sale by or on the order of a physician. |
|  | Defibrillation-proof<br>Type CF applied parts |
|  | Consult the accompanying Instructions for Use |
|  | Refer to User Manual or Instructions for Use included with Administration Set |
|  | Refer to User Manual or Instructions for Use included with Administration Set |
|  | The CURLIN 8000 is covered by the Waste Electrical and Electronic Equipment Directive (WEEE Directive), a European law setting collection, recycling, and recovery targets for all type of electrical goods. |
|   | The CURLIN 8000 was independently evaluated by TUV, a Nationality Recognized Testing Laboratory (NRTL). |
|   | MR unsafe. The CURLIN 8000 is not safe for use in an MRI environment. |

## Clinician, Patient, Caregiver Training

**Warning** Failure to train clinicians and caregivers regarding the care, use and maintenance of the pump and accessories may result in critical or serious patient harm.

A physician or a certified, licensed health care provider "clinician" should oversee all infusion therapies. All clinicians using the pump must receive training. Their employer must certify that they are competent to use the pump. All physicians and clinician users should read this User's Manual for complete instructions, warnings, and cautions.

Note: "user" is defined as someone who programs the pump (programmer), which may be a pharmacist or clinician, or someone who maintains the infusion (infusion maintainer), which may be a clinician or home user.

Home users are caregivers and patients who receive infusion pumps from, or on the order of, a health care provider and who use the pumps under the supervision of a licensed practitioner in any setting outside a healthcare facility, including the home.



**Warning** Do not disclose pump access codes or any information that would allow the patient or unauthorized clinician complete access to programming and operating functions. Do not permit the patient or an unauthorized clinician to become familiar with the procedure for giving a clinician bolus. Improper or unauthorized programming or delivery of the clinician bolus could result in serious patient injury or death.

Do not leave the CURLIN 8000 unattended while unlocked. All programming functions are accessible while the CURLIN 8000 is unlocked.

A patient using the pump must be instructed in performing basic tasks to operate it and maintain the infusion for himself/herself. If the patient is unable to perform these tasks, the patient must have a responsible caregiver in proximity or in the same household. A qualified clinician must instruct all patients and caregivers in using the pump. Patients and caregivers must demonstrate an adequate level of proficiency in using the pump, administration sets, and accessories. Patients may refer to the therapy specific CURLIN 8000 Ambulatory Infusion System Patient Information Guides to aid them in performing the tasks associated with their prescribed treatment:

- Continuous Therapy Patient Information Guide
- Intermittent Therapy Patient Information Guide
- PCA Therapy Patient Information Guide
- TPN Therapy Patient information Guide

- Variable Therapy Patient Information Guide

The health care provider delivering the infusion therapy is responsible for ensuring that patients and/or their designated caregivers fully understand applicable pump operating functions and the proper delivery of the therapy.

**Warning** The CURLIN 8000 is NOT safe for use in an MRI environment. The CURLIN 8000 should not enter the MRI scanner room. The device presents a projectile hazard.

At a minimum, Moog recommends that before using the CURLIN 8000, the patient and/or caregiver should be educated on the following items:

| Task | Information Location/Instructions |
|---|---|
| When will I use the pump? | The health care provider will review with the patient the length of time the patient will be connected to the pump and when the patient will be disconnected. |
| Where should I store my medication and pump when not in use? | The health care provider will review with the patient how to store medication. Do not store the pump in the refrigerator or freezer. |
| Where should I not use the CURLIN 8000 pump? | "Warnings, Cautions and Notices", p. 4 |
| What information should I check on the pump screen to make sure it is programmed with the correct infusion for me? | "Adding/Verifying Patient Information", p. 40 |
| How do I make sure the pump is programmed to deliver the correct dose of medicine? | See the appropriate therapy Home screen (some therapies have multiple Home screens):<br>Figure 5-2: Continuous Therapy Home Screen, p. 48<br>Figure 6-2: PCA Therapy Home Screen, p. 56<br>Figure 7-2: TPN Therapy Home Screen, p. 65<br>Figure 8-2: Intermittent Therapy Home Screen (Dose being Infused), p. 73<br>Figure 9-2: Variable Therapy Home Screen (Step being Infused), p. 81 |
| What should I do if the pump's therapy program does not match the medication label? | The health care provider will review this with the patient. |

| Task | Information Location/Instructions |
|---|---|
| How do I know that the pump is infusing and what do I do if it is not? | “Infusion Status Indicator Lights”, p. 18 and “Screen and Pump Status Bar Colors”, p. 19 |
| What should I do if the infusion is delayed or interrupted? | The health care provider will review this with the patient. |
| How do I resume a therapy after a power cycle? | Resuming an Infusion after a Power Loss”, p. 104 |
| How do I repeat a therapy? | “Repeating the Current Rx”, p. 107 |
| What notifications and alarms may appear and how do I respond to them? | Chapter 14, User Assistance and References, p. 142 |
| How do I check the administration set package for damage, sterility, and use by date? | Administration Set Instructions For Use (found in packaging) |
| How do I load the administration set? | “Installing the Administration Set into the CURLIN 8000”, p. 89 |
| How do I remove air from the administration set? | “Priming the Administration Set”, p. 86 |
| What are the components of the administration set? | Chapter 10, Administration Sets and Priming, p. 85 |
| When and how do I use the slide clamp on the administration set? | Chapter 10, Administration Sets and Priming, p. 85 |
| When do I change the administration set? | The health care provider will review this with the patient. |
| What do I do if I see an air bubble in the administration set? | The health care provider will review this with the patient. |
| How do I use the aseptic technique when connecting the administration set to the IV bag/reservoir? | The health care provider will review this with the patient. |
| How do I use the aseptic technique when connecting the vascular access device? | The health care provider will review this with the patient. |
| How do I change batteries and how often should I change them? | “Replacing Batteries or Rechargeable Battery Pack”, p. 133 |
| How do I connect the pump to an external AC power source? | “Connecting/Disconnecting the External AC Power Supply”, p. 130 |
| Who do I call for assistance (24 hours/day)? | The health care provider will review this with the patient. |
| When should I call for emergency assistance (911)? | The health care provider will review this with the patient. |
| How do I clean the pump and accessories during use if needed? | “Cleaning the Pump”, p. 170 |
| How do I manage the pump and my catheter during bathing? | The health care provider will review this with the patient. |

| Task | Information Location/Instructions |
|---|---|
| How do I manage my infusion during the night or when leaving the home? | The health care provider will review this with the patient. |
| How do I place the pump and IV bag into a carry pack or hang from an IV pole? | Chapter 13, Accessories, p. 130 |
| How do I use the included accessories? | Chapter 13, Accessories, p. 130 |
| How do I discard used tubing and IV bags? | The health care provider will review this with the patient. |
| What should I do if the pump is dropped or damaged? | Discontinue use and return to health care provider. |

# Chapter 2. CURLIN 8000 Tour

Familiarize yourself with the parts of the pump, shown in Figure 2-1, Figure 2-2, and Figure 2-3.

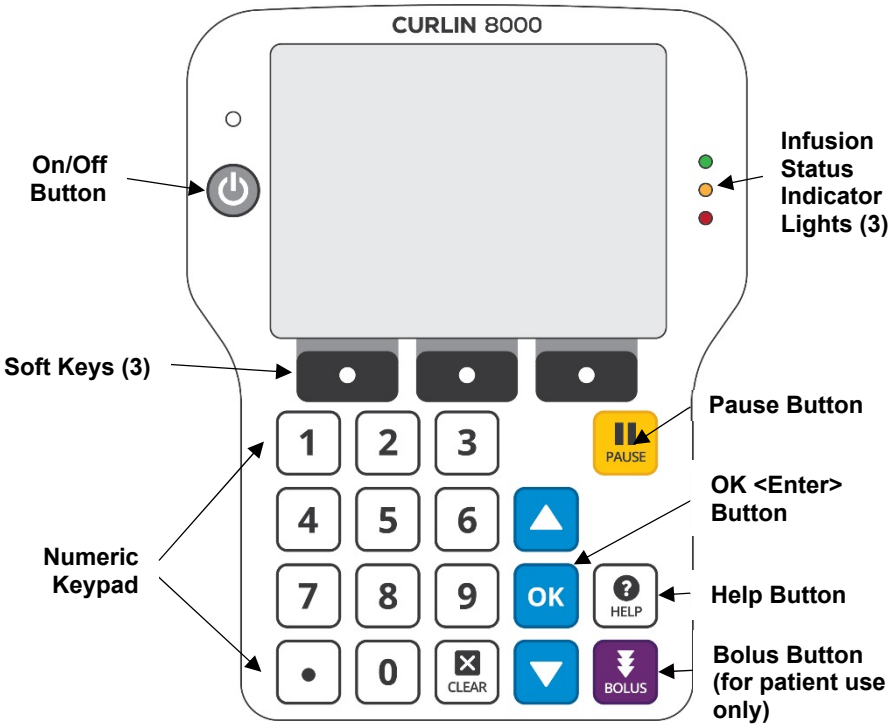



**Figure 2-1: Front View**

| | |
|---|---|
| **Caution** | Do not try to insert foreign objects into any of the CURLIN 8000 connectors. Foreign objects may damage the pump. |

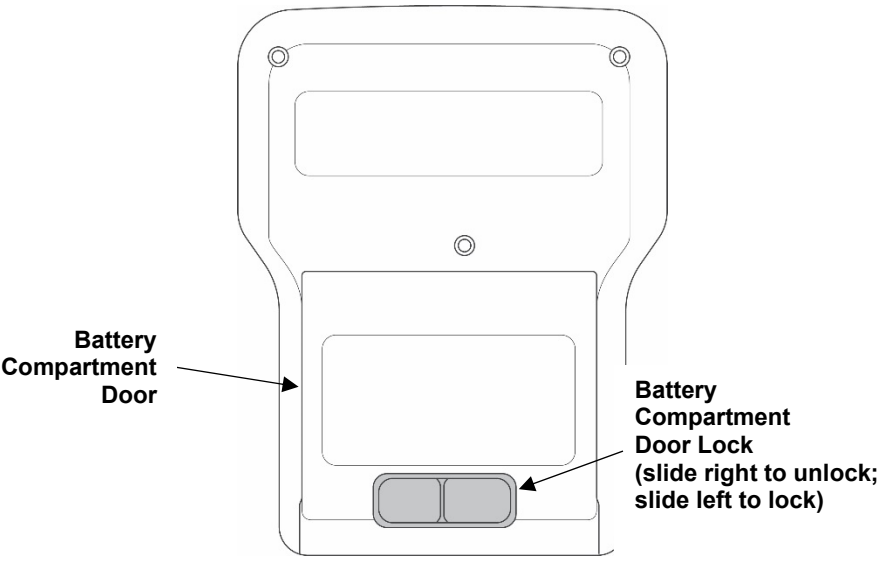



**Figure 2-2: Back View**

**Note:** In this figure, the CURLIN 8000 door is not visible because it is shown completely open.

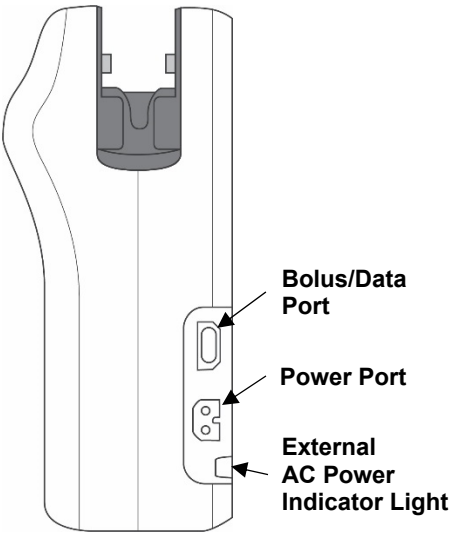



**Figure 2-3: Left Side View**

## Battery Compartment Door

The battery compartment door at the back of the pump allows access to the disposable C-Cell alkaline batteries or the rechargeable battery pack (Figure 2-2). For more information, see “Batteries and Rechargeable Battery Pack”, p. 133.

## CURLIN 8000 Door

The latched door at the top of the pump is where the administration set is installed (Figure 2-3). For more information, see Chapter 10, Administration Sets and Priming, p. 85.

## Bolus/Data Port

The Bolus/Data port is used for two functions:

| Function: | Definitions: |
|---|---|
| Data Transfer | A CURLIN data cable can be used to connect the pump and a computer with the RxManager software installed.<br>Using the RxManager software, a user can transfer the pump’s configuration (basic settings) and custom Patient Specific Protocols (PSPs) to the pump.<br>Historical reports can be exchanged between the pump and the RxManager. |
| PCA Bolus Handset | A CURLIN PCA bolus handset can connect to the pump through the bolus/data port.<br>The PCA bolus handset is used in the PCA therapy mode to allow patients to request a patient bolus. It is an alternative to pressing BOLUS on the pump’s keypad. |

For more information on using the Bolus/Data port, see Chapter 13, Accessories, p. 130.

## Power Port

The Power port allows you to connect the pump to an external AC power source using a power cord. For more information, see “AC Power Cord”, p. 130.

## Infusion Status Indicator Lights

The three infusion status indicator lights are located to the right of the screen (Figure 2-1). They provide visual confirmation of the status of the infusion (Table 2-1).

**Table 2-1: Infusion Status Indicator Lights and Meanings**

| Color: | Indicates: |
|---|---|
| Green | During all therapies, the pump is running and delivering programmed rate of infusion. |
| Yellow | During all therapies, infusion is paused, or due to a Medium Priority alarm. |
| Red | During all therapies, when the infusion is stopped due to a High Priority alarm condition or when the infusion is complete with no KVO programmed. |
| Yellow and Green | During PCA therapy, when the basal rate is zero and no bolus is in progress, or when the hourly limit is reached.<br>During delay start with no KVO programmed.<br>During Intermittent therapy when the infusion is between doses with no KVO programmed. |
| Green and Red | When infusion is complete and KVO rate is programmed (greater than 0 mL/hr). |
| Green, Yellow, and Red | When infusion is complete and KVO rate is programmed (greater than 0 mL/hr) and there is a Medium Priority alarm. |
| Yellow and Red | When infusion is complete, a KVO is programmed, and the infusion is paused due to a High Priority alarm. |

## Home Screen

Figure 2-4 is an example of the home screen, which shows a current running PCA infusion. The Infusion Progress Meter on the right side provides a visual indication of the infusion's progress, gradually turning to grey as the infusion is delivered.

When the pump is actively infusing, the display will always revert to the home screen. The home screen is:

- Green when running
- Yellow when paused
- Blue when infusion is complete

See Table 2-2 for a complete list of screen colors and what they indicate.

The information on the home screen provides a quick review of the status of the infusion. The home screen for each therapy mode is designed to provide the most pertinent information for that therapy. (See specific therapy mode Chapters 5-9 for more information.)

**Note:** After 2 minutes of no key presses, the screen will dim. Press **OK** to return the screen to its original brightness level.

### Home Screen Components


**Figure 2-4: "Home Screen" Showing Running Infusion**

### Screen and Pump Status Bar Colors

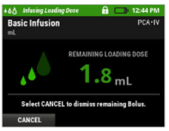
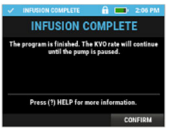
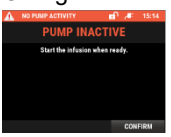
Color is used to indicate status and alarm information on the screen. The colors also allow you to monitor the infusion status from across the room.

The Pump Status Bar provides:

- Information on the current state of the pump, with an icon and descriptive words (left side)
- Icons for locked/unlocked status of the keypad, battery and power status, and the current time (right side)

Table 2-2 shows the colors on the screen and defines them:

**Table 2-2: Screen and Pump Status Bar Colors and Meanings**

| Color: | Indicates: |
|---|---|
| Green  |   The pump is running. Green = All is good. The infusion is running without any issues. |
| Yellow  |   The pump is paused. |
| Red  |   An urgent situation such as an alarm. When you see red, the pump has stopped infusing and you must take action immediately. |
| Blue  |   The infusion (Rx) has ended. |
| Aqua  |   The pump is being used to prime (fill) the administration set tubing. |
| Orange  |   An urgent situation, such as a medium priority alarm condition. |

**Note:** For a list of all notifications, alarms, and error codes, see Chapter 14, User Assistance and References, p. 142.

Figure 2-5 shows the display of the keypad lock and unlock icon in the Pump Status Bar:


**Figure 2-5: Keypad Lock and Unlock Icons**

Table 2-3 shows various battery icons and statuses:

**Table 2-3: Battery Icons and Status Descriptions**

| Battery Icon | Description |
|---|---|
|  | Battery is fully charged (100-90%) |
|  | Rechargeable battery is fully charged.<br>Pump is running on external AC power. |
|  | Battery is 90-60% charged. |
|  | Battery is 60-40% charged |
|  | Rechargeable battery is less than 40% charged.<br>External AC power is connected and is charging the battery. |
|  | Rechargeable battery is low. External AC power is connected and is charging the battery. |
|  | Rechargeable or disposable batteries are low and have less than 20% life remaining. AC power is not connected. Replace the batteries or connect pump to AC power very soon.<br>Icon blinks when the battery life is less than 30 minutes. |
|  <br>Alternating icons | Disposable batteries are low and have less than 20% power remaining.<br>AC power is connected. Replace the batteries soon. |
|  | Battery is empty. Infusion has stopped. You should connect to external AC power or replace the batteries. |
|  | Pump is connected to external AC power and no battery is installed. You should install batteries. |

### Header

On the left side, the Header displays the program mode (**Basic Infusion** if the therapy was entered via the pump keypad or the name of the drug if the therapy is a patient specific protocol (PSP), programmed using the RxManager) and delivery units and concentration of the drug/fluid (unless programmed in milliliters). On the right side is the therapy mode. If the therapy is a PSP, the template name is displayed below the therapy mode (Figure 2-6).

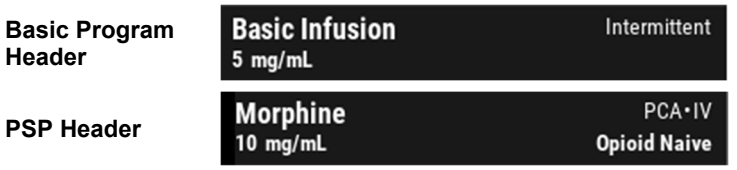



**Figure 2-6: Header Examples**

### Active Program Area

The active program area is where the infusion program (Rx) information may be entered, reviewed, and edited (Figure 2-7). The active infusion parameters will also be displayed and updated in this area when displaying the home screen (Figure 2-4).


**Figure 2-7: Active Program Area Examples**

### Soft Key Labels

Soft key labels (Figure 2-8) are:

- Located at the bottom of the screen and are associated with the physical buttons that are immediately below them.
- Contextual and change according to the active program area.

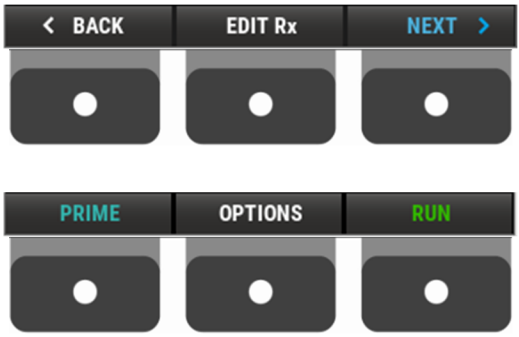



**Figure 2-8: Soft Key Label Examples**

## Keypad Button Functions

**Caution** Use only fingertips to press the keypad buttons. Do not use sharp objects, which will damage the keypad.

Table 2-4 defines the available buttons.

**Table 2-4: Keypad Button Functions**

| Button | Image | Description |
|---|---|---|
| On/Off |  | Powers the pump on or off; located to the left of the screen. |
| Soft Keys |  | This set of three keys corresponds to the labels on the screen, located above each of the keys. |
| Up Arrow |  | Selects required field by moving up. |
| OK |   | Accepts highlighted or entered data. |

| Button | Image | Description |
|---|---|---|
| Down Arrow |  | Selects required field by moving down. |
| PAUSE |  | Temporarily stops the running infusion. |
| HELP |  | Provides additional information about the displayed screen (if available). |
| BOLUS |  | For patient use only: Used in PCA therapy for a patient to request a PCA bolus. This button is inactive when the PCA bolus handset is connected to the pump. |
| Numeric Keypad |  | Use numbers and decimal to enter numerical values within programming fields.<br>Use the CLEAR button to delete/clear the values entered in the fields, one digit at a time. |

## Screen-Level Help

**Important** Most pump screens have screen-level help to explain how to use that screen.

1. To view the information associated with a screen, press **HELP**. If a screen does not have any help associated with it, an audio tone sounds when you press the **HELP** button.
2. Press ▼ or ▲ to scroll through the text.
3. When you are finished, press **BACK**.

## Notes

# Chapter 3. CURLIN 8000 Startup



**Warning** Visually inspect the CURLIN 8000 and pumping chamber before use:
- Do not use the CURLIN 8000 if it has been dropped.
- Do not use the CURLIN 8000 if it appears the pump has been tampered with. If the pump has been tampered with or it has been dropped, return the CURLIN 8000 to the provider, e.g., the pharmacy, contracted distributor, or Moog Medical.

To avoid potential fire hazard, do not use the pump near flammable anesthetics, explosive gases or in an oxygen rich environment such as Hyperbaric Oxygen Therapy. Note: Use with supplementary oxygen and ventilation is allowed.

Adhere to any warnings, precautions, or recommendations stated by drug manufacturers regarding the use of infusion pumps and disposable administration sets in the administration of their specific products.

Administer all drugs in accordance with the indications included in the manufacturer's package insert accompanying the drugs including, but not limited to, use of approved routes of delivery.

The pump comes with a factory default configuration. However, Moog recommends that before the pumps are used, the health care facility sets up a custom configuration based on its own policies and procedures, including setting a custom lock level access code.

Moog also recommends using the RxManager dose error reduction software for programming patient specific protocols (PSPs). The pump can be programmed in the Basic infusion mode. However, Basic programming does not provide dose error reduction support. For information using the RxManager, see the CURLIN RxManager Enterprise Solution Software User Manual.

For information about the factory default settings, see Chapter 16, Default Configuration, p. 174.

The next section describes the differences between PSPs and Basic programs. If you are unfamiliar with the pump and the different program types, continue with the next section. Otherwise, go to "Powering On the CURLIN 8000", p. 33.

## PSPs and Basic Programs

The pump can store up to two programmed therapies for a specific patient. The clinician, with the access code, can make changes to either program type. The pump can store:

- One Patient Specific Protocol (PSP),
- One Basic program, or
- One PSP and one Basic program.

Figure 3-1 is an example of a Select Patient's Rx screen of a pump that contains both a PSP and a Basic program. (The Basic program, highlighted in blue, is shown selected.)

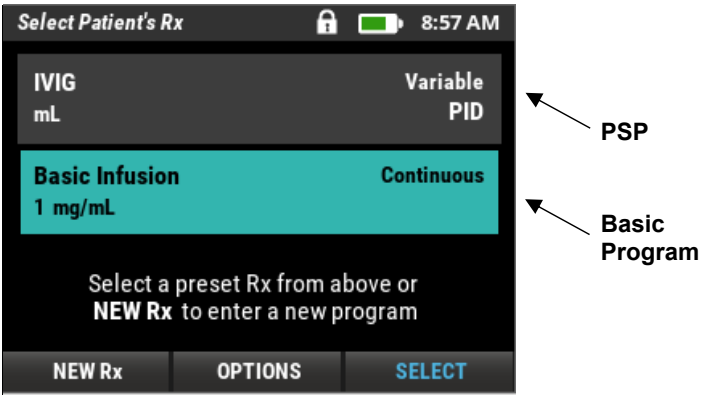



**Figure 3-1: Select Patient's Rx Screen**

### Understanding and Using PSPs

A PSP is an infusion program that the pharmacist creates using a dose error reduction software application called RxManager Enterprise Solution Software. Once created, the PSP is uploaded to the pump for a specific patient. It includes all the infusion program values (for example, rate, duration, VTBI) and pump settings designated for this patient with a specified drug for a specified indication. For more information, see "PSP Settings by Therapy Mode", p. 30.

### Hard and Soft Limits

The hard and soft limits set in the RxManager allows the pump to warn clinicians of programming edit mistakes that would result in significant over- or under-delivery of a drug, electrolyte, or other fluid.

Once a PSP is uploaded to the pump, the clinician, with the access code, can make changes to it. The edited PSP program values are checked against preset limits that are specific to the drug, clinical application, and location of delivery. The pump will alert the clinician if the edited programmed value is outside of the usual limits (for example, the rate). The pump will either ask the clinician to confirm that the value is correct before accepting it (called a soft limit) or the pump will not accept a value if it is outside of the allowed range and require the clinician to reprogram the value (called a hard limit).

For example, a PSP contains the following limits for Rate:

Upper Hard Limit (UHL): 300 mL/hr

Upper Soft Limit (USL): 250 mL/hr

Lower Soft Limit (LSL): 50 mL/hr

Lower Hard Limit (LHL): 10 mL/hr

| **If the clinician changes the continuous Rate:** | **Then:** |
|---|---|
| between 50 mL/hr and 250 mL/hr | the pump accepts the value |
| between 250mL/hr and 300 mL/hr, or between 10 mL/hr and 50 mL/hr | a notification will appear, asking the clinician to confirm overriding the soft limit |
| below 10 mL/hr, or above 300 mL/hr | the pump will require that the clinician correct the entry to a value within the hard limit range |

For information about editing a PSP, see Chapter 4, CURLIN 8000 Programming.

### PSP Settings by Therapy Mode

This section lists the parameters that are transferred to the pump as part of and uploaded PSP, by therapy mode.

The settings for the parameters marked with an asterisk (*) are not visible or editable on the pump.

#### Continuous Therapy Mode

- Drug Name
- Programming Units
- Concentration (mg, mcg)
- Template name (if available)
- Bag Volume
- KVO Rate
- Amt TBI
- Dose Rate/Rate
- Dose Rate Limits: UHL/USL/LSL/LHL*
- Duration
- Delay Start Time
- Occlusion Sensitivity
- Air in Line Sensitivity
- Lock Level Setting
- Access Code*
- Patient Prime Permission*
- Basic Rx Enable/Disable*
- Near End of Infusion Alarm*
- End of Infusion Escalation*
- Clinical Advisories

#### PCA Therapy Mode

- Drug Name
- Programming Units
- Concentration (mg, mcg)
- Template name (if available)
- Delivery Route
- Bag Volume
- Delivery Limit Mode
  -Max # of boluses/hour
  -1-hour limit
- Basal Rate
- Basal Rate Limits: UHL/USL*
- PCA Bolus
- PCA Bolus Limits: UHL/USL*
- Lockout Time
- Lockout Time Limits: LHL*
- 1 Hour Limits: UHL/USL*
- Max # of Bolus Limits: UHL/USL*
- Loading Dose Limits: UHL/USL*
- Clinician Bolus (Enabled/Disabled) *
- Clinician Bolus Limits: UHL/USL*
- Clinician Bolus included in 1 hour limit (enabled/disabled)
- Occlusion Sensitivity
- Air in Line Sensitivity
- Lock Level Setting
- Access Code*
- Basic Rx Enable/Disable *
- Near End of Infusion Alarm*
- End of Infusion Escalation*
- Clinical Advisories

**Variable Therapy Mode**

- Drug Name
- Programming Units
- Concentration (mg, mcg)
- Template name (if available)
- Bag Volume
- KVO Rate
- # of Steps
- Step Amt TBI
- Step Duration
- Step Rate
- Step Rate Limits: UHL/USL*
- Delay Start Time
- Occlusion Sensitivity
- Air in Line Sensitivity
- Lock Level Setting
- Access Code*
- Patient Prime Permission*
- Basic Rx Enable/Disable*
- Near End of Infusion Alarm*
- End of Infusion Escalation*
- Clinical Advisories

**TPN Therapy Mode**

- Drug Name
- Template name (if available)
- Bag Volume
- KVO Rate
- Vol TBI
- Up Ramp
- Down Ramp
- Total Duration
- Plateau Rate
- Plateau Rate Limits: UHL/USL/LSL/LHL*
- Delay Start Time
- Occlusion Sensitivity
- Air in Line Sensitivity
- Lock Level Setting
- Access Code*
- Patient Prime Permission*
- Basic Rx Enable/Disable *
- Near End of Infusion Alarm*
- End of Infusion Escalation*
- Clinical Advisories

**Intermittent Therapy Mode**

- Drug Name
- Programming Units
- Concentration (mg, mcg)
- Template name (if available)
- Bag Volume
- KVO Rate
- Dose Frequency
- Amount per Dose
- Dose Duration
- Dose Rate
- Dose Rate Limits: UHL/USL/LSL/LHL*
- Doses per bag
- Next Dose Start Time
- Occlusion Sensitivity
- Air in Line Sensitivity
- Lock Level Setting
- Access Code*
- Patient Prime Permission*
- Edit Next Dose Start Time Permission*
- Basic Rx Enable/Disable *
- Near End of Infusion Alarm*
- End of Infusion Escalation*
- Clinical Advisories

### PSP Details Record

When the pharmacist creates the PSP using the RxManager, there is an option to print a PDF document showing all the parameters and associated values. This document is the PSP Details Record. It is recommended to include this PSP Details Record with the paperwork given to the clinician managing the infusion.

The settings for the parameters marked with an asterisk (*) above are not visible or editable on the pump. The values for all the PSP parameters, except for the Access Code, are included on the PSP Details Record.

## Understanding and Using Basic Programs

A Basic program is one that the clinician programs entirely from the pump, entering values using the keypad.

### Upper and Lower Limits

The pump is programmed with a configuration using the RxManager. This configuration establishes which of the five therapy modes and delivery units are enabled for Basic programming.

The configuration also establishes hard limits for each of the enabled therapy modes. These hard limits are more restrictive than the standard system limits and are not-to-exceed values. When entering or editing a Basic program at the pump, the pump will not allow the clinician to enter a rate value above the upper system limit or upper hard limit (UHL) or below the lower system limit or lower hard limit (LHL). If the entered rate exceeds any of the hard limits, a notification appears on the screen (Figure 3-2). Basic programs do not have soft limits (USL or LSL) associated with them.

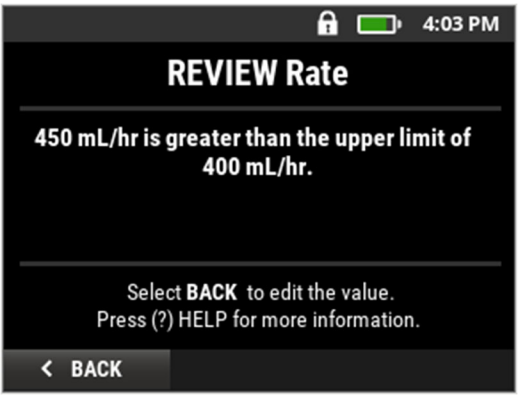



**Figure 3-2: Notification Screen Example**

For information about creating or editing a Basic program at the pump, see Chapter 4, CURLIN 8000 Programming.

## Powering On the CURLIN 8000

**Important** Before powering on the pump, make sure the pump contains fully charged disposable C-Cell batteries or the rechargeable battery pack. You can also connect the pump to external AC power. For more information, see Chapter 13, Accessories, p. 130.

To power on the pump, press the On/Off button, located to the left of the screen.

When the pump is functioning properly, startup splash screens display for several seconds (Figure 3-3), the infusion status indicator lights to the right of the screen flash in sequence, and an audio tone sounds. Make sure the graphics shown on the startup splash screens are complete (no areas are missing). If the graphics are incomplete or the pump makes unusual sounds, do not use the pump. Return it for service. See “Customer Support Help”, p. 142.


**Figure 3-3: Startup Splash Screens**


Most screens have help text associated with them. To view information about a specific screen, press **HELP**.

**Note:** If the pump is due for its annual preventative maintenance, a notification appears: PM REMINDER. For more information, see “Notifications”, p. 143.

## No Patient/Verify Patient Screen

After the startup splash screens, a Patient screen appears and contains important information.

**Important** Always check the information on the Verify Patient screen carefully to make sure that it matches your patient.

### No Patient Screen

If the pump has not yet been programmed, the No Patient screen in Figure 3-4 is displayed:

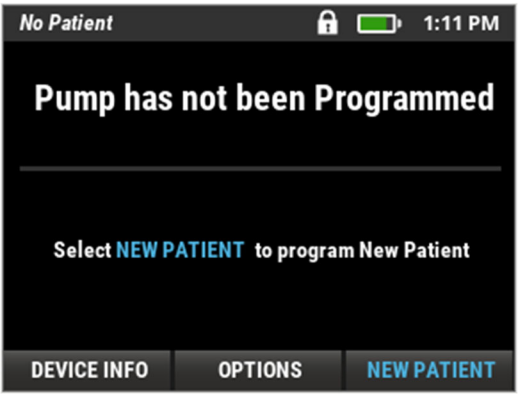



**Figure 3-4: No Patient Screen**

## Verify/Verify Patient Screen

If the pump was previously programmed, the Verify or Verify Patient screen is displayed.

If the pump contains a Basic program, it will display the date the program was entered. Depending on your facility's policy, it may display the Patient ID instead (Figure 3-5).

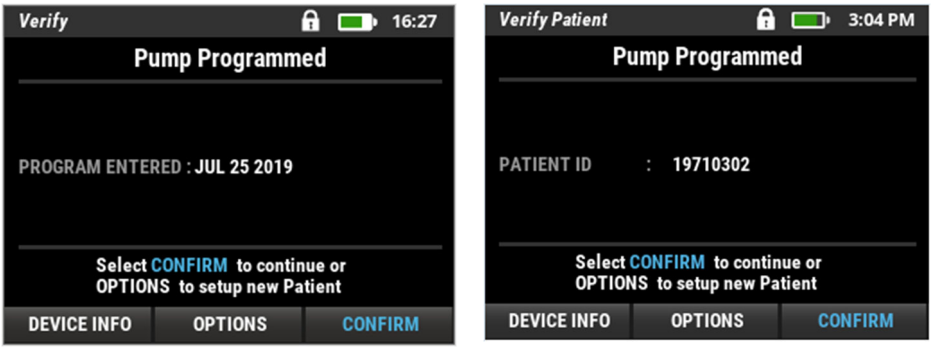



**Figure 3-5: Verify/Verify Patient Screens (Basic Programming)**

If the pump contains a PSP, it will display the patient's name. Depending on your facility's policy, it may also display the patient's date of birth (DOB), patient ID, and Rx # (Figure 3-6).


**Figure 3-6: Verify Patient Screen (PSP)**

**Warning** If the settings on the pump do not match the medication order, call the patient's health care provider before starting the infusion.

| If this Patient screen is displayed: | And patient information is: | Then: | Continue with: |
|---|---|---|---|
| No Patient | (N/A) → | The pump has not yet been programmed. You will need to enter the program into the pump. | Chapter 4, CURLIN 8000 Programming, p. 39 |
| Verify/Verify Patient (Basic Programming) | Correct (Patient ID or Program Entered Date) | Press **CONFIRM**. The Select Patient's Rx screen appears, displaying one program. | The current program on the pump will be highlighted; press **SELECT**. Then press **NEXT** to view the Rx Details screen(s). Continue with step 3c, p. 41. **Note:** If the desired Rx is not displayed, press **NEW Rx on the SELECT Patient's Rx screen**. Continue with Chapter 4, CURLIN 8000 Programming, p. 39. |
| Verify Patient (PSP) | Correct | Press **CONFIRM**. The Select Patient's Rx screen appears, displaying one or two programs. | Highlight the desired infusion program, and then press **SELECT**. Then press **NEXT** to view the Rx Details screen(s). Continue with step 3c, p. 41. **Note:** If the desired Rx is not displayed, press **NEW Rx on the SELECT Patient's Rx screen**. Continue with Chapter 4, CURLIN 8000 Programming, p. 39. |

| If this Patient screen is displayed: | And patient information is: | Then: | Continue with: |
|---|---|---|---|
| Verify Patient (Basic Programming or PSP) | Incorrect | You need to clear the pump for the new patient and enter the correct infusion prescription.<br>**Important:** Once you select **NEW PATIENT** and confirm that you want to erase the current patient, the current patient's program is permanently deleted, and you will be unable to access it. | Press **OPTIONS**, then select **NEW PATIENT**. Continue with "Adding/Verifying Patient Information", p. 40.<br>**Note:** If NEW PATIENT is not listed as an option or **Option not Available** is displayed, Basic programming is disabled. Contact your pharmacy to obtain a different pump with the correct patient and therapy. |

## Notes

# Chapter 4. CURLIN 8000 Programming

Before programming a specific therapy, you must verify or enter patient information. Although optional, assigning a pump program to a patient ID tracks the patient's infusion history. This helpful information is captured in reports that pharmacy personnel can use.

**Important** For a list of all parameter definitions and ranges, see "Terminology and Definitions", p.164.

## Before Starting Programming

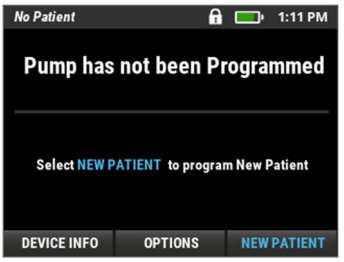
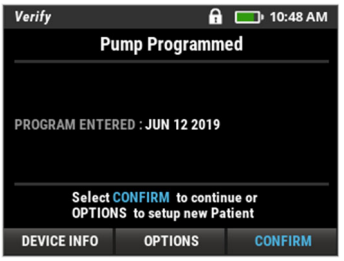
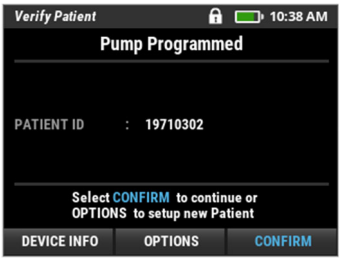
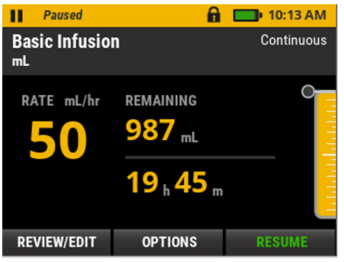
Install disposable C-Cell batteries, rechargeable battery pack, or connect the external AC power supply to the pump (see Chapter 13, Accessories, p. 130).

Power on the pump (see Chapter 3, CURLIN 8000 Startup, p. 27).


Most screens have help text associated with them. To view information about a specific screen, press **HELP**.

## Adding/Verifying Patient Information

1. After the CURLIN 8000 splash screens disappear, one of the following appears:

| | |
|---|---|
| No Patient screen<br>This means that no patient information is currently stored in the pump.<br>Go to step 2. |  |
| Verify screen or<br>Verify Patient screen<br>Go to step 3. |  <br>  |
| Paused Infusion home screen<br>Go to “Resuming an Interrupted Infusion”, p. 104. |  |

2. When no patient information is in the pump, do the following:
   a. Press **NEW PATIENT**.
   b. If your facility requires you to enter a Patient ID, use the numeric keypad to enter the Patient ID and press **CONFIRM**. Otherwise, press **SKIP**. The Select Patient’s Rx screen appears.
   c. Press **NEW Rx**.
   d. Go to Step 4.

3. Check the current patient information. This information could include the patient's name (may be abbreviated) patient ID, Rx #, or DOB (date of birth), or just the date.

   If the information matches the patient:

   a. Press **CONFIRM**. The Select Patient's Rx screen displays one or two programmed therapies (Figure 4-1).

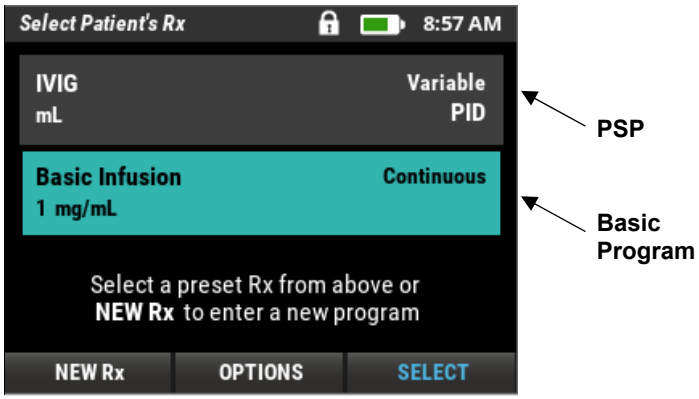



**Figure 4-1: Select Patient's Rx Screen**

If the Select Patient's Rx screen contains two programed therapies, one is a PSP (Patient Specific Program; the health care provider created it using the RxManager and downloaded to the pump) and the other is a Basic Program (programmed from the pump).

   b. It is very important to select the correct Rx. Press ▼ or ▲ to select the therapy you want to start and then press **SELECT**. The Rx Details screen(s) display therapy information.

   c. **Important:** Carefully check the therapy information to make sure it is correct for this patient. Press **NEXT** until the Infusion Summary screen appears.

      If the therapy is correct, install and prime the administration set before starting the infusion. Continue with Chapter 10, Administration Sets and Priming, p. 85.

      If you need to make changes to the therapy, press **OPTIONS**, press ▼ and then select **Rx TASKS**, then select **EDIT Current Rx**. Continue with "Editing the Current Rx", p. 111.

If you need to clear the current patient information and add a new patient:

**Important** If you continue with the following steps, all current patient information, including report information about that patient, will be permanently deleted from the pump.

a. Press **OPTIONS** to view the Options screen.

b. Press ▼ or ▲ to select **NEW PATIENT**; press **SELECT**.

c. Using the numeric keypad, enter the Access Code and press **CONFIRM**. A notification appears: NOTE! NEW PATIENT SELECTED, alerting you that the existing patient will be cleared.

d. Press **NEW** to clear existing patient and Rx information and to view the Enter Patient Info. screen.

Once New Patient is confirmed, the following items will be reset:

| | |
|---|---|
| **Audio Level** | Reset to Level “3” |
| **Occlusion Sensitivity** | Reset to level in pump configuration |
| **Air In Line Sensitivity** | Reset to level in pump configuration |
| **Lock Level** | Reset to level in pump configuration |
| **Access Code** | Reset to level in pump configuration<br>*Unique access code may have been set for the previous patient via the PSP. |

**Note:** If the pump is configured with Basic programming disabled, a notification appears: NEW PROGRAM NOT ALLOWED. For more information, see “Notifications”, p. 143.

e. If facility policy is to:

| | |
|---|---|
| Not enter the Patient ID | Press **SKIP** to view the Select Patient’s Rx screen. |
| Enter the Patient ID | Use the numeric keypad to enter the Patient ID; press **CONFIRM** to view the Select Patient’s Rx screen. |

f. Press **NEW Rx** to view the Select Therapy Mode screen. At this point, you will select the specific therapy you want to program and enter the prescription information.

4. See the appropriate therapy chapter for specific Basic Programming information.

| For Basic Programming of: | Continue with: |
|---|---|
| Continuous Therapy | Chapter 5, p. 45 |

| | |
|---|---|
| PCA Therapy | Chapter 6, p. 51 |
| TPN Therapy | Chapter 7, p. 61 |
| Intermittent Therapy | Chapter 8, p. 69 |
| Variable Therapy | Chapter 9, p. 77 |

**Note:** During programming and editing on the pump, when you successfully change an option or parameter, a notification appears: SETTING SAVED. Your changes are saved to the pump.

## Notes

# Chapter 5. Continuous Therapy Mode

Continuous therapy delivers a constant, programmed rate of infusion for a programmed volume and duration (Figure 5-1).

Typical applications of Continuous therapy are hydration or chemotherapy.

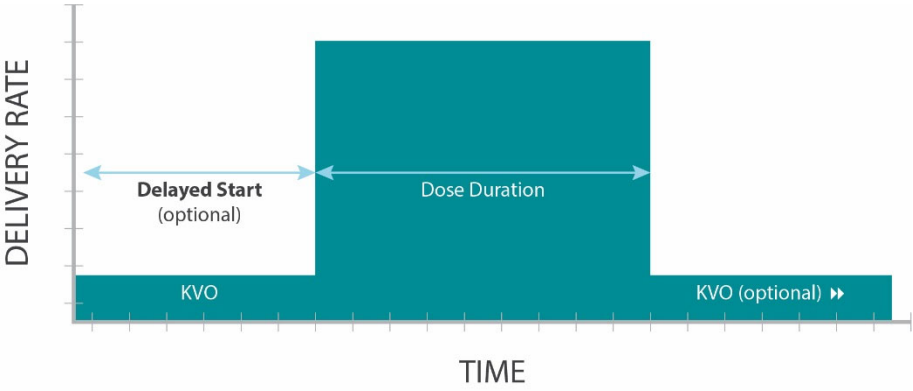



**Figure 5-1: Continuous Therapy Graph**

**Important** For a list of all parameter definitions and ranges, see “Terminology and Definitions”, p.164.

## Continuous Therapy Program Settings

| Parameter | Definition |
|---|---|
| Bag Volume | This is the actual volume of fluid that is contained in the IV bag/drug reservoir. The displayed value will decrease after priming and while the infusion is in progress.<br>When repeating an infusion program, the Bag Volume will be reset to the original bag volume amount. |
| KVO<br>(Keep Vein Open) | The KVO rate is an optional setting. It is the rate at which the pump will deliver during a delayed start and at the end of the infusion.<br>The KVO is designed to maintain a patent catheter when the patient is connected to a running pump while a dose is not in progress. |
| Amt TBI<br>(Amount To Be Infused) | The Amt TBI is the total dose that will be delivered from the programmed Bag Volume.<br>It is entered and displayed in the units in which the program is being entered. For example, if programming in mg, the amount to be infused will be programmed in mg. |

| Parameter | Definition |
|---|---|
| Dose Rate/ Rate | The Dose Rate is the amount of the medication in mg or mcg that will be delivered in one hour. The Rate is the equivalent volume mL/hr. |
| Duration | The Duration is the length of time in which the infusion will take to be delivered.<br>The duration includes the time from the beginning of the dose to the end of the dose. It does not include any delayed start time or post infusion KVO. |

## Programming a Continuous Therapy

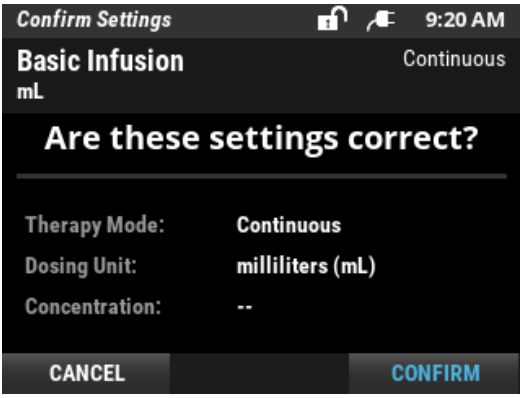

Most screens have help text associated with them. To view information about a specific screen, press **HELP**.

**Note:** If at any point during programming a therapy you press CANCEL, a notification appears: DISCARD EDITS? Any parameters you entered will not be saved.

Before you program a therapy, verify, or add patient information (see Chapter 4, CURLIN 8000 Programming, p. 39). Then follow these steps:

1. In the Select Therapy Mode screen, press ▼ or ▲ to select **CONTINUOUS**; press **NEXT** to view the Select Dose Unit screen.
2. Press ▼ or ▲ to select the required dose unit; press **NEXT**.
3. If you selected mg or mcg, use the numeric keypad to enter the concentration (mg/mL or mcg/mL); press **NEXT**.

   Otherwise, go to step 4.
4. A screen will appear (see below) asking if the settings are correct. If correct, press **CONFIRM.**




5. In the Enter Parameters screen, use the keypad to enter the **Bag Volume**; press **OK**.

6. The default KVO infusion rate is "- -", which is 0.0 mL/hr. Use the keypad to enter the value of **KVO** or leave it at default; press **NEXT**.
7. In this screen, Amt TBI, Rate, and Duration parameters are listed. You may enter any 2 of the 3 values and the third is calculated automatically. To skip a parameter, press ▼ or ▲. Otherwise, use the keypad to enter a value; press **OK**.

   **Note:** If any parameter value exceeds the allowed limit, the pump will alert you to change the value within the range.

7. A PROGRAMMED SAVED notification will appear and then the RxDetails screen will appear.

8. Check the entered parameter values. If there is more than one Rx Details screen, press **NEXT** to view additional ones.

   If you need to make changes to the infusion program, press **EDIT Rx**. Repeat steps 5 through 8. (If the dose unit or concentration is incorrect, you will need to reprogram the entire therapy. Press **EXIT**, then select **PROGRAM**, **NEW Rx (Program)** and start a new therapy program.)
9. If the infusion therapy information is correct, press **NEXT** to view the Infusion Summary screen.
10. This therapy is now saved in the pump. You can:
    - Familiarize yourself with the information displayed on a typical Continuous therapy home screen. Continue with the next section.
    - Install and prime the administration set tubing and start the therapy immediately or at a future time (delayed start). Continue with Chapter 10, Administration Sets and Priming, p. 85.
    - Power off the pump. The saved patient and infusion program will be available when the pump is powered on again.

## Continuous Therapy Home Screen

Figure 5-2 is an example of a Continuous therapy home screen. Familiarize yourself with the information that is displayed.

The top of this screen displays the infusion status. This example shows that the infusion is currently running (animated drops).

The header bar will show either Basic Infusion (if the program was entered manually), or the drug name (if the program is a PSP). The Active Program Area in the middle of the screen displays the volume left to be infused (165 mL) and the time left for this infusion (15 hours, 00 minutes).

---

**Important** From any running or paused home screen, to view details about the programmed therapy, press **REVIEW/EDIT**. The Rx Details screen(s) appear. Viewing the Rx Details screens does not affect the current infusion state.

---


**Figure 5-2: Continuous Therapy Home Screen**

## Options: Continuous-Specific Rx Tasks

### Repeating a Continuous Therapy

If you make changes to an original therapy program (see “Editing the Current Rx”, p. 111) and then repeat it (see “Repeating the Current Rx”, p. 107), then in that repeated Rx:

- Some parameters will be repeated with their original values
- Other parameters will retain their edited values

Table 5-1 lists the Continuous therapy parameters and how the pump uses those values during a repeated Rx.

**Table 5-1: Continuous Therapy Rx Repeat Rules**

| Continuous Therapy Parameters | Rx Repeat Rule |
|---|---|
| Bag Volume | Original values will always be repeated |
| Amt TBI | |
| KVO | Edited values will be repeated (if edit occurred) |
| Rate/Dose Rate | |
| Duration | Recalculated based on repeated values |

See “Repeating the Current Rx”, p. 107 for step-by-step instructions.

# Chapter 6. PCA Therapy Mode



Patient Controlled Analgesia (PCA) is used for therapies that require a continuous rate of infusion, patient-controlled demand doses, and/or a clinician-activated bolus (Figure 5-1).

A typical application of PCA therapy is pain management, such as morphine.

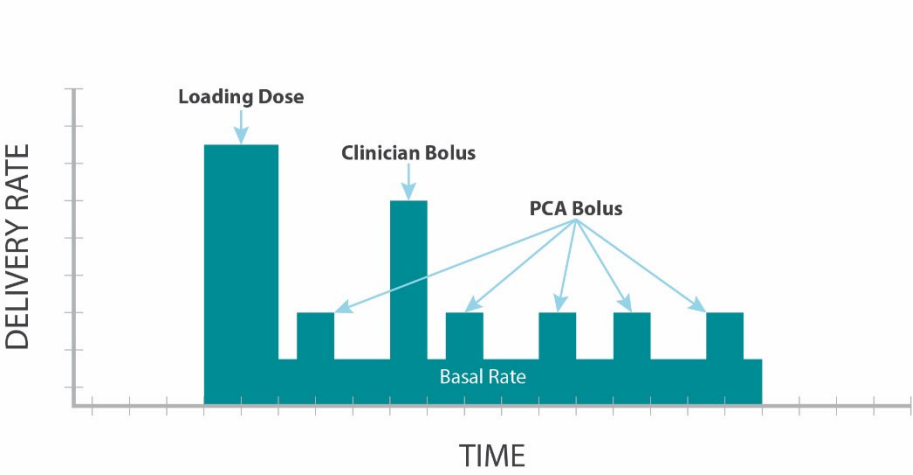



**Figure 6-1: PCA Therapy Graph**

**Important** For a list of all parameter definitions and ranges, see “Terminology and Definitions”, p.164.

## PCA Therapy Program Settings

| Parameter | Definition |
|---|---|
| Bag Volume | This is the actual volume of fluid that is contained in the IV bag/drug reservoir. The displayed value will decrease after priming and while the infusion is in progress.<br>When repeating an infusion program, the Bag Volume will be reset to the original bag volume amount. |
| Loading Dose | This is a one-time dose that is delivered at the beginning of the infusion. Loading doses do not get repeated when the patient is repeating the same infusion (e.g., after a bag change). This is an optional setting. |
| Basal Rate | This is the amount of medication per hour that is being delivered continuously throughout the infusion. This is an optional setting. |

| Parameter | Definition |
|---|---|
| PCA Bolus | This is the amount of medication that is delivered each time the patient presses the bolus button on the pump keypad or the button on the PCA bolus handset. The PCA bolus must not be in a lockout period for the bolus to be delivered.<br>PCA boluses given and attempted are tracked in the Hourly Totals report (see p. 115). |
| Lockout | This is the minimum amount of time that must pass after one PCA bolus starts until the next PCA bolus is available. |
| Delivery Limit Modes | There are two modes available for further restricting the amount of medication the patient may receive.<br>Max # of Boluses per Hour<br>This is the highest number of requested PCA boluses a patient may receive in any 60-minute window. The PCA bolus will be restricted by whichever is more limiting between the lockout time and the max # of boluses. (This delivery limit mode is available when programming a Basic program using the pump or a PSP using the RxManager.)<br>1 Hour Limit<br>This delivery limit mode is only available when programming a PSP using the RxManager. This is the maximum amount of medication the patient can receive in any 60-minute window. Medication delivery that is included in the 1 Hour Limit includes: the basal rate, PCA boluses, and may or may not include the clinician bolus. The loading dose is not included in the 1 Hour Limit. Inclusion of the clinician bolus is determined by the pharmacist when setting up the PSP. |

Note: The clinician bolus is not affected by the lockout time.

## Programming a PCA Therapy


Most screens have help text associated with them. To view information about a specific screen, press **HELP**.

**Note:** If at any point during programming a therapy you press CANCEL, a notification appears: DISCARD EDITS? Any parameters you entered will not be saved.

Before you program a therapy, verify, or add patient information (see Chapter 4, CURLIN 8000 Programming, p. 39). Then follow these steps:

1. In the Select Therapy Mode screen, press ▼ or ▲ to select **PCA** and then press **NEXT** to view the Select Route screen.

   Each of the routes has defined settings (Table 6-1):

**Table 6-1: PCA Administration Route Default Settings for Basic Programmed Infusions**

| Administration Route | Max Occlusion Setting (mmHg) | Max Basal Rate (mL/hr) | Default Rate During Bolus (mL/hr) | Max Bolus Dose (mL) | Max Load Dose (mL) | Max Bolus Delivery Rate (mL/hr) |
|---|---|---|---|---|---|---|
| Intravenous (IV) | 900 | 10 | 125 | 10 | 10 | 125 |
| Subcutaneous (SQ) | 900 | 10 | 60 | 10 | 10 | 60 |
| Epidural (EPI) | 900 | 10 | 90 | 10 | 10 | 90 |

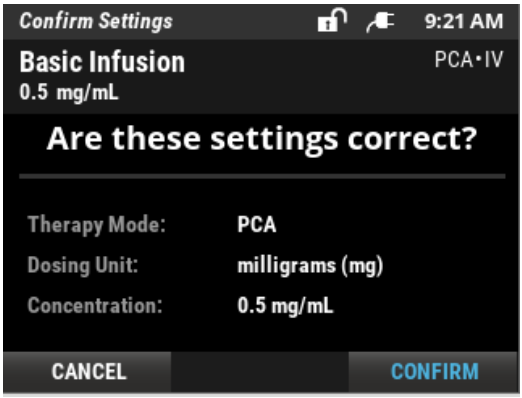
**Note:** When using a PSP, the maximum values for these settings are determined by the pharmacy and are part of the PSP.

**Warning** Administer all drugs in accordance with the indications included in the manufacturer's package insert accompanying the drugs including, but not limited to, use of approved routes of delivery.

2. From the available options, select the route (catheter location) in which the infusion will be delivered. Press the ▼or ▲ to select one of the following:
   - IV (INTRAVENOUS)
   - SQ (SUBCUTANEOUS)
   - EPI (EPIDURAL)

   And then press **NEXT**.
3. Press ▼ or ▲ to select the dosing unit and press **NEXT**.
4. If you selected mg or mcg, use the numeric keypad to enter the concentration (mg/mL or mcg/mL) and then press **NEXT**.

   Otherwise, go to step5.
5. A screen will appear (see below) asking if the settings are correct. If correct, press **CONFIRM**




6. In the Enter Parameters screen, use the keypad to enter the **Bag Volume** and then press **OK**.
7. Use the keypad to enter the value of the **Loading Dose** (it can be left blank) then press **NEXT** to view the Enter Bolus Parameters screen.
8. Use the keypad to enter the value of the **Basal Rate** and then press **OK**.

   If the prescription does not specify a basal rate during a PCA therapy, leave the field as-is and then press **OK**.
9. Use the keypad to enter the value of the **PCA Bolus** and then press **OK**.

   If the prescription does not specify a PCA bolus, type **0** in the field and then press **OK**. Continue with step 11.

   **Note:** When the PCA bolus is programmed as 0, Lockout time and Max #Bolus per hour fields are disabled.
10. Use the keypad to enter the **Lockout** time. For example, to enter a lockout time of 1 hour, press 1 0 0 for 1 h, 00 m; press **OK**.
11. Use the keypad to enter the **Max # Bolus per hour** and then press **OK**.

    If the prescription does not specify a max # of boluses per hour, leave the field as-is and then press **OK**; press CONFIRM

12. . A PROGRAMMED SAVED notification will appear and then the RxDetails screen will appear.

13. Check the entered parameter values.

    If you need to make changes to the infusion program, press **EDIT Rx**. Repeat steps6 through 12. (If the dose unit or concentration is incorrect, you will need to reprogram the entire therapy. Press **EXIT**, then select **OPTIONS**, **PROGRAM**, **NEW Rx (Program)** and start a new therapy program. If there is more than one Rx Details screen, press **NEXT** to view additional ones.)

14. If the infusion therapy information is correct, press **NEXT** to view the Infusion Summary screen.

15. This therapy is now saved in the pump. You can:

    - Familiarize yourself with the information displayed on a typical PCA therapy home screen. Continue with the next section.
    - Set up any of the available options for this therapy. See “Options: PCA-Specific Rx Tasks”, p. 57.
    - Install and prime the administration set tubing and start the therapy. Continue with Chapter 10, Administration Sets and Priming, p. 85.
    - Power off the pump. The saved patient and infusion program will be available when the pump is turned back on.

## PCA Therapy Home Screen

Figure 6-2 is an example of a PCA therapy home screen. Familiarize yourself with the information that is displayed.

The top of this screen displays the infusion status, which changes depending on what is being delivered. This example shows that the infusion is currently running (animated drops) and that the Basal dose rate is currently being infused. Other infusion statuses include Loading Dose, PCA Bolus, and Clinician Bolus.

The header bar will show either Basic Infusion (if the program was entered manually), or the drug name (if the program is a PSP). The Active Program Area in the middle of this screen displays the remaining bag volume (45.4 mL), the PCA bolus amount (0.2 mg) and the lockout time between PCA boluses (15 minutes).

---

**Important** From any running or paused home screen, to view details about the programmed therapy, press **REVIEW/EDIT**. The Rx Details screen(s) appear. Viewing the Rx Details screens does not affect the current running therapy.

---


**Figure 6-2: PCA Therapy Home Screen**

## Options: PCA-Specific Rx Tasks

**Note:** This section contains therapy-specific tasks.
General non-therapy-specific tasks, such as editing the current infusion, delaying the start of an infusion, priming, and others, are in other areas of the manual. See the Contents or Index.

---

**Important** Actual delivery rate of a clinician bolus or PCA bolus = Basal Rate + Bolus Delivery Rate

---

### Changing the Bolus Delivery Rate during a PCA Therapy

The bolus delivery rate is the speed at which the boluses will be delivered during use of the PCA therapy. This includes the loading dose, clinician boluses, and PCA boluses. The maximum bolus rate is established by the health care facility. The clinician may reduce the bolus delivery rate as needed according to the current patient's needs. The bolus delivery rate can be decreased to minimize downstream occlusion alarms, which may occur during the delivery of a bolus. Always consider patient status, route of delivery, and catheter or needled length and gauge when setting the bolus delivery rate.

You can change the bolus delivery rate during a PCA therapy, but you must pause the therapy first.

1. Press **PAUSE**.
2. From the paused PCA therapy home screen, press **OPTIONS**.
3. Press ▼ to select **RxTASKS**; press **SELECT**.
4. Press ▼ to select **BOLUS DELIVERY RATE**; press **SELECT**.

   **Note:** The Bolus Delivery Rate feature is not available if the infusion has completed (Bag Volume zero—Infusion Complete).

5. Using the keypad, type the access code. The current Bolus Rate is displayed.
6. Using the keypad, type the new rate; press **CONFIRM**. This new rate will be used when the patient presses the remote bolus button, the BOLUS button on the keypad, or when the clinician starts a bolus.
7. Press **RESUME** to continue the PCA therapy.

### Starting a Clinician Bolus during a PCA Therapy

The PCA infusion therapy clinician bolus feature allows the clinician to deliver an extra bolus to the patient using the pump rather than through an external syringe. An authorized clinician may program a bolus when the pump is running or paused. If a bolus is started when the pump is paused, the bolus will begin infusing after pressing RUN. This feature should only be used according to the prescribing health care provider's orders.

A clinician bolus:

- Cannot be started while a PCA bolus or a loading dose is in progress.
- Decreases the programmed bag volume and increases the given amount in the clinical reports.
- May be stopped in progress.

---

**Warning** Do not permit the patient or an unauthorized clinician to become familiar with the procedure for giving a clinician bolus. Improper or unauthorized programming or delivery of the clinician bolus could result in serious patient injury or death.

---

While the PCA therapy is running or paused:

1. Press **OPTIONS**.
2. Press ▼ to select **RxTASKS**; press **SELECT**.
3. Press ▼ to select **CLINICIAN BOLUS**; press **SELECT**.

   **Note:** If the PCA therapy infusion is complete or if the Clinician Bolus is disabled from the PSP, a notification appears: OPTION NOT AVAILABLE.

4. Using the keypad, type the access code.
5. Use the keypad to enter the bolus value then press **RUN**.

   **Note:** If a 1 Hour Delivery Limit is part of the PSP program, the pharmacist will determine if the Clinician Bolus will be included in the Limit. This information will be displayed on the Clinician Bolus programming screen. If the entered bolus value will exceed the PSP 1 hour limit amount, a notification appears: BOLUS EXCEEDS LIMIT. If the entered bolus value would exceed the remaining bag volume, a notification appears: AMOUNT NOT AVAILABLE. For more information, see "Notifications", p. 143.

   The screen displays the remaining clinician bolus amount as it infuses.

   - To pause the clinician bolus, press **PAUSE**.
   - To re-start the clinician bolus, press **RESUME**.
   - To cancel a clinician bolus that is infusing, press **CANCEL**.

## Requesting a PCA Bolus

---

**Warning** Only the patient may use the PCA bolus handset and BOLUS button on the CURLIN 8000. If anyone other than the patient initiates a PCA bolus, it may cause the patient to receive too much medication that could result in serious patient injury or death.

---

If a PCA bolus is ordered, the patient can use the BOLUS button on the pump or the button on the PCA bolus handset. When the bolus handset is connected to the pump, the BOLUS button on the keypad is inactive.

| **When a PCA bolus dose is requested and a bolus is:** | **The pump responds with:** |
|---|---|
| Available | A two-tone sound, indicating that the bolus has started.<br>The pump will display the Infusing PCA Bolus screen.<br>The bolus will be recorded in the Hourly Totals report as given. |
| Unavailable<br>(the lockout time has not passed or the delivery limit was reached) | A single tone sounds.<br>The pump will display a message that the bolus was not given.<br>The bolus attempt will be recorded in the Hourly Totals report as attempted but not given. |

## Repeating a PCA Therapy

If you make changes to an original therapy program (see “Editing the Current Rx”, p. 111) and then repeat it (see “Repeating the Current Rx”, p. 107), then in that repeated Rx:

- Some parameters will be repeated with their original values
- Other parameters will retain their edited values

Table 6-2 lists the PCA therapy parameters and how the pump uses those values during a repeated Rx.

**Table 6-2: PCA Therapy Rx Repeat Rules**

| PCA Therapy Parameters | Rx Repeat Rule |
|---|---|
| Bag Volume | Original value will always be repeated |
| Basal Rate | Edited values will be repeated (if edit occurred) |
| PCA Bolus | |
| Lockout Time | |
| 1 Hour Limit | |
| Max # of Boluses per Hour | |

See “Repeating the Current Rx”, p. 107 for step-by-step instructions.

# Chapter 7. TPN Therapy Mode

Total Parenteral Nutrition (TPN) therapy allows a constant rate of infusion of parenteral nutritional products with the option of tapering at the beginning, end, or both of the infusion (Figure 7-1). The KVO feature allows delivery of a small amount of fluid before and/or after the infusion has completed to maintain catheter patency.

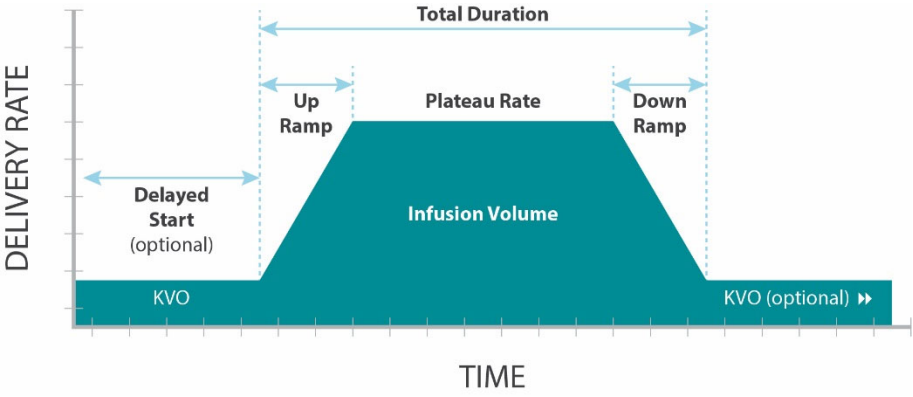



**Figure 7-1: TPN Therapy Graph**

**Important** For a list of all parameter definitions and ranges, see “Terminology and Definitions”, p.164.

## TPN Therapy Program Settings

| Parameter | Definition |
|---|---|
| Bag Volume | This is the actual volume of fluid that is contained in the IV bag/fluid reservoir. The displayed value will decrease after priming and while the infusion is in progress.<br>When repeating an infusion program, the Bag Volume will be reset to the original bag volume amount.<br>Note: When determining the needed Bag Volume, the pharmacist should consider the +/- accuracy of the pump, the priming volume required for the chosen administration set, the volume needed for the KVO period, and the volume to be infused (Vol TBI). |
| Vol TBI (Volume To Be Infused) | The Vol TBI is the total dose that will be delivered from the programmed bag volume.<br>It is entered and displayed in milliliters. |

| Parameter | Definition |
|---|---|
| KVO (Keep Vein Open) | The KVO rate is an optional setting. It is the rate at which the pump will be delivering during a delayed start and at the end of the infusion until the bag volume reaches zero.<br>The KVO is designed to maintain a patent catheter when the patient is connected to a running pump while a dose is not in progress. |
| Plateau Rate | The plateau rate is the rate that the dose will be delivered excluding the ramp periods. |
| Ramp Up | The Ramp Up duration is an optional setting that allows the infusion to gradually increase from 0.1 mL/hr up to the Plateau Rate.<br>Once the ramp up is initiated, it cannot be edited. |
| Ramp Down | The Ramp Down duration is an optional setting that allows the infusion to gradually decrease from the Plateau Rate down to zero or to the programmed KVO rate. |
| Total Duration | The Total Duration is the amount of time it will take to run the entire infusion including the Ramp Up duration, the Plateau duration, and the Ramp Down duration.<br>The Total Duration does not include any KVO periods. |

## Programming a TPN Therapy

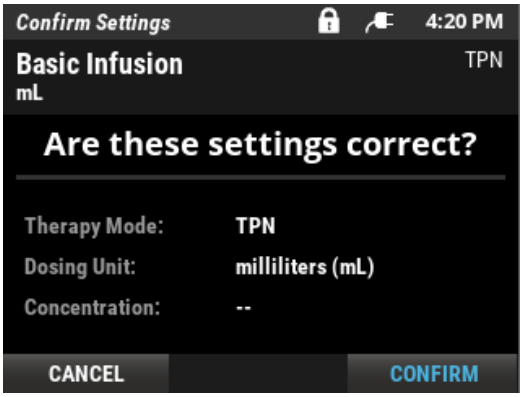

Most screens have help text associated with them. To view information about a specific screen, press **HELP**.

**Note:** If at any point during programming a therapy you press CANCEL, a notification appears: DISCARD EDITS? Any parameters you entered will not be saved.

Before you program a therapy, verify, or add patient information (see Chapter 4, CURLIN 8000 Programming, p. 39). Then follow these steps:

1. In the Select Therapy Mode screen, press ▼ or ▲ to select **TPN**; press **NEXT**.

2. A screen will appear (seen below) asking if the settings are correct. If correct, press **CONFIRM.**




3. Use the keypad to enter the **Bag Volume**; press **OK**.
4. Use the keypad to enter the **Vol TBI** (Volume To Be Infused); press **OK**.
5. The default KVO infusion rate is 0.0 mL/hr ("- -" on the screen). Press **OK** to use the default rate or use the keypad to enter the **KVO**; press **OK**.
6. Press **NEXT**. From this screen, you must enter the Ramp Up and Ramp Down times or enter 0h 0m if not applicable.
   You can enter either the Plateau Rate or the Total Duration. The other value is calculated automatically based on what you entered for the Vol TBI, Ramp Up/Ramp Down durations, and either the Plateau Rate or Total Duration.

   **Note:** If you enter a Total Duration that is less than the Ramp Up plus Ramp Down durations, a notification appears: REVIEW PROGRAM. Adjust the durations so that they meet the requirements.

7. Press ▼ to skip the Plateau Rate.

   Or use the keypad to enter the **Plateau Rate**; press **OK**.
8. Use the keypad to enter the duration of **Ramp Up**; press **OK**.
9. Use the keypad to enter the duration of **Ramp Down**; press **OK**.
10. If you did not enter a Plateau Rate, use the keypad to enter the value of **Total Duration**. Otherwise, the calculated Total Duration value appears. Press **CONFIRM**
11. A PROGRAMMED SAVED notification will appear and then the RxDetails screen will appear.
12. Check the entered parameter values. If there is more than one Rx Details screen, press **NEXT** to view additional ones.

    If you need to make changes to the infusion program, press **EDIT Rx**. Repeat steps 3 through 12.
13. If the infusion therapy information is correct, press **NEXT** to view the Infusion Summary screen.
14. This therapy is now saved in the pump. You can:

- Familiarize yourself with the information displayed on a typical TPN therapy home screen. Continue with the next section.
- Set up any of the available options for this therapy. See “Options: TPN-Specific Rx Tasks”, p. 66.
- Install and prime the administration set tubing and start the therapy immediately or at a future time (delayed start). Continue with Chapter 10, Administration Sets and Priming, p. 85.
- Power off the pump. The saved patient and infusion program will be available when the pump is powered back on.

## TPN Therapy Home Screen

Figure 7-2 is an example of a TPN therapy home screen. Familiarize yourself with the information that is displayed.

The top of this screen displays the infusion status, which changes depending on what is being delivered. This example shows that the infusion is currently running (animated drops). In addition to the Infusing status, other statuses include Delay, Ramp Up, and Ramp Down.

The header bar will show either Basic Infusion (if the program was entered manually), or the drug name (if the program is a PSP). The Active Program Area in the middle of the screen displays the volume left to be infused (1521 mL) and the time left for this infusion until end of ramp down, or if no ramp down, the end of plateau (10 hours, 15 minutes).

The TPN Phase will display “Ramping up to: <Rate>”, “Plateau” or “Ramping down”.

If the Infusion Progress Meter contains arrows, they indicate the ramp up (top arrow on the Infusion Progress Meter) and ramp down (bottom arrow on the Infusion Progress Meter) duration compared to the overall infusion.

**Important** From any running or paused home screen, to view details about the programmed therapy, press **REVIEW/EDIT**. The Rx Details screen(s) appear. Viewing the Rx Details screens does not affect the current running therapy.


**Figure 7-2: TPN Therapy Home Screen**

## Options: TPN-Specific Rx Tasks

**Note:** This section contains therapy-specific tasks.
General non-therapy-specific tasks, such as editing the current infusion, delaying the start of an infusion, priming, and others, are in other areas of the manual. See the Contents or Index.

### Immediate Ramp Down

During the TPN therapy ramp up or plateau phase of infusion, you may need to begin the ramp down phase early. The early ramp down feature can be used to initiate the ramp down immediately. When ramping down early, the originally programmed volume to be infused (Vol TBI) will not be delivered because the program will be ending early.

The immediate ramp down can also be used while a down ramp is in progress to decrease the remaining duration of the down ramp.

**Note:** The Immediate Ramp Down feature is not available for programming once the infusion is complete or if the original ramp down period was programmed to 0 h 0.

1. First, pause the TPN infusion by pressing **PAUSE**.
2. Press **OPTIONS**.
3. Press ▼, select **RxTASKS**, press **SELECT**.
4. Press ▼, select **IMMEDIATE RAMP DOWN**, press **SELECT**.
5. The current Ramp Down Duration is displayed. To start the ramp down using this time, press **OK**. Otherwise, use the keypad to enter a new duration; press **OK**.

   If the immediate ramp down duration is greater than the remaining or programmed ramp down duration, a notification appears: REVIEW RAMP DURATION. Decrease the Ramp Down Duration time.
6. Press **RUN**. The Ramp Down begins.

## Repeating a TPN Therapy

If you make changes to an original therapy program (see “Editing the Current Rx”, p. 111) and then repeat it (see “Repeating the Current Rx”, p. 107), then in that repeated Rx:

- Some parameters will be repeated with their original values
- Other parameters will retain their edited values

Table 7-1 lists the TPN therapy parameters and how the pump uses those values during a repeated Rx.

**Table 7-1: TPN Therapy Rx Repeat Rules**

| TPN Therapy Parameters | Rx Repeat Rule |
|---|---|
| Bag Volume | Original values will always be repeated |
| Vol. TBI | |
| KVO | Edited values will be repeated (if edit occurred) |
| Plateau Rate | |
| Up Ramp Duration | |
| Down Ramp Duration | |
| Total Duration | Recalculated based on repeated values |

See “Repeating the Current Rx”, p. 107 for step-by-step instructions.

## Notes

# Chapter 8. Intermittent Therapy Mode

Intermittent therapy allows programming of a specified dose amount to be delivered at regular repeating intervals for a specified number of doses. An optional KVO (keep vein open) rate may be programmed to be delivered between doses to maintain catheter patency (Figure 8-1). The KVO feature allows delivery of a minimal amount of drug between doses to maintain catheter patency. You may also delay the start of the first dose by using the Next Dose Start Time task.

A typical application of Intermittent Therapy is antibiotic delivery.

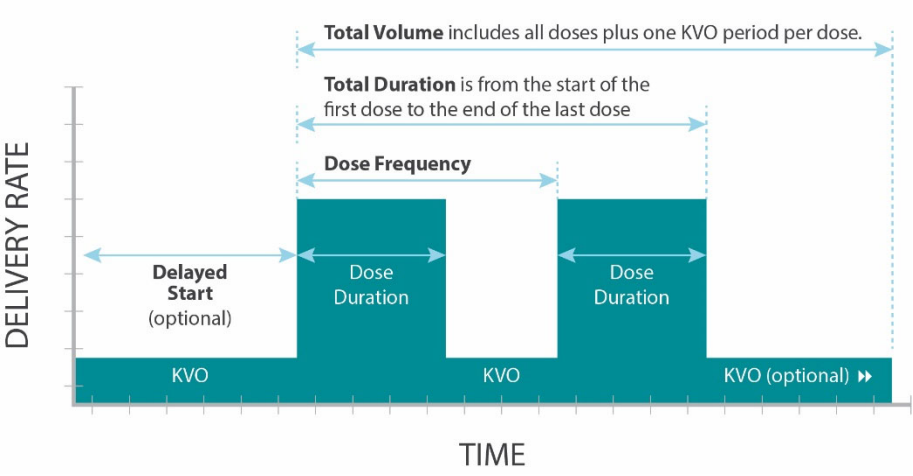



**Figure 8-1: Intermittent Therapy Graph**

**Important** For a list of all parameter definitions and ranges, see “Terminology and Definitions”, p.164.

## Intermittent Therapy Program Settings

| Parameter | Definition |
|---|---|
| Bag Volume | This is the actual volume of fluid that is contained in the IV bag/drug reservoir. The displayed value will decrease after priming and while the infusion is in progress.<br>When repeating an infusion program, the Bag Volume will be reset to the original bag volume amount.<br>Note: When determining the needed Bag Volume, the pharmacist should consider the +/- accuracy of the pump, the priming volume required for the chosen administration set, the volume needed for the KVO period, and the Total Dose amount (volume to be infused). |

| Parameter | Definition |
|---|---|
| KVO (Keep Vein Open) | The KVO rate is an optional setting. It is the rate at which the pump will be delivering between doses, during a delayed start, and at the end of the infusion until the bag volume reaches zero.<br>The KVO is designed to maintain a patent catheter when the patient is connected to a running pump while a dose is not in progress. |
| Dose Frequency | The amount of time between the beginning of one dose and the beginning of the next dose. When repeating the entire infusion program (for example, when changing the IV bag) the pump will maintain the dose frequency schedule. |
| Amount per Dose | The amount of medication that will be given during each dose. It is programmed in the units selected on the Dose Units programming screen.<br>The Amount per Dose multiplied by the Number of Doses must be less than the Bag Volume. |
| Dose Duration | The length of time from the beginning of a dose to the end of a dose. |
| Dose Rate | The speed at which each dose will be delivered. |
| Number of Doses per bag | The number of doses that will be delivered from the programmed Bag Volume. The pump will not allow programming of more doses than the programmed Bag Volume will be able to provide, or the 200-dose system limit, whichever is lower. |
| Total Volume | This value is calculated by the pump and cannot be edited. It includes the volume needed for each dose plus the volume needed for one KVO period per dose.<br>When entering the Number of Doses, the Total Volume will display the volume that will be used out of the programmed Bag Volume. |
| Total Dose | This value is calculated by the pump and cannot be edited. It includes the Amt per Dose multiplied by the Number of Doses. |
| Total Duration | This value is calculated by the pump and cannot be edited. It includes the time needed from the start of the first dose to the end of the last dose. It does not include time needed for a delayed start (if one is programmed). |

## Programming an Intermittent Therapy

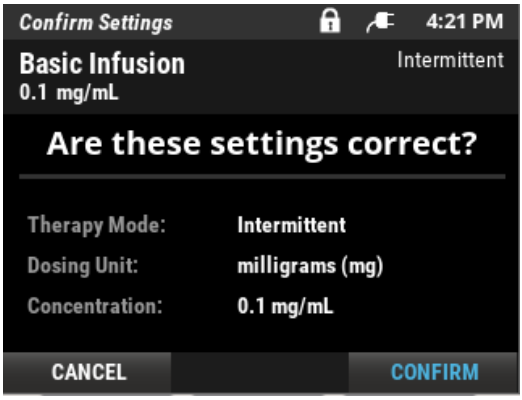

Most screens have help text associated with them. To view information about a specific screen, press **HELP**.

**Note:** If at any point during programming a therapy you press CANCEL, a notification appears: DISCARD EDITS? Any parameters you entered will not be saved.

Before you program a therapy, verify, or add patient information (see Chapter 4, CURLIN 8000 Programming, p. 39). Then follow these steps:

1. In the Select Therapy Mode screen, press ▲ or ▼ to select **INTERMITTENT**; press **NEXT**.
2. Press ▼ or ▲ to select the dosing unit; press **NEXT**.
3. If you selected mg or mcg, use the numeric keypad to enter the concentration (mg/mL or mcg/mL); press **NEXT**.

   Otherwise, go to step 4.
4. A screen will appear (seen below) asking if the settings are correct. If correct, press **CONFIRM.**




5. In the Enter Parameters screen, use the keypad to enter the **Bag Volume**; press **OK**.
6. Use the keypad to enter the KVO rate; press **NEXT**. The default KVO infusion rate is "- -", which is 0.0 mL/hr.
7. Use keypad to enter Dose Frequency; press **OK**.
8. Press **NEXT**.
9. On the next screen, you can enter any two of the three parameters: Amt per Dose, Dose Duration, and Dose Rate. After entering two parameters, the third is calculated automatically. Use the keypad to enter two parameters; press **OK** to go to the next parameter.
   To skip a parameter, press ▼.

   **Note:** If after you enter the Dose Rate and Amt per Dose the auto-calculated Dose Duration is longer than 24 hours or less than 1 minute, the notification appears: CHECK DOSE DURATION. Adjust the parameters to meet the required range.
10. When you are finished entering parameters, press **NEXT**.
11. Use the keypad to enter the Number of Doses per bag; press **OK.**

    The Total Volume and the Total Duration will be calculated automatically. These two values are for informational purposes only and cannot be edited. Press **CONFIRM**

**Note:** The Dose Duration must be less than the Dose Frequency. Otherwise, the notification appears: REVIEW PROGRAM The dose duration must be shorter than the dose frequency. Press **BACK** to review the program for accuracy. If the program is correct, decrease the Number of Doses per bag.

12. A PROGRAMMED SAVED notification will appear and then the RxDetails screen will appear.

13. Check the entered values. If there is more than one Rx Details screen, press **NEXT** to view additional ones.

    If you need to make changes to the infusion program, press **EDIT Rx**. Repeat steps5 through 13. (If the dose unit or concentration is incorrect, you will need to reprogram the entire therapy. Press **EXIT**, then select **PROGRAM**, **NEW Rx (Program)** and start a new therapy program.)

14 If the infusion therapy information is correct, press **NEXT** to view the Infusion Summary screen.

15 This therapy is now saved in the pump. You can:

- Familiarize yourself with the information displayed on a typical Intermittent therapy home screen. Continue with the next section.
- Set up any of the available options for this therapy. See “Options: Intermittent-Specific Rx Tasks”, p. 74.
- Install and prime the administration set tubing and start the therapy immediately or at a future time. Continue with Chapter 10, Administration Sets and Priming, p. 85.
- Power off the pump. The saved patient and infusion program will be available when the pump is powered back on.

## Intermittent Therapy Home Screens

Figure 8-2 is an example of an Intermittent therapy home screen while a dose is being infused. Familiarize yourself with the information that is displayed.

The top of this screen displays the infusion status, which changes depending on what is being delivered. This example shows that the infusion is currently running (animated drops) and that dose 1 of 4 is currently being infused. During KVO, it displays what the next dose is (Figure 8-3).

The header bar will show either Basic Infusion (if the program was entered manually), or the drug name (if the program is a PSP). The Active Program Area in the middle of the screen displays the dose rate (100 mL), volume left to be infused for this dose (Dose 1, 49.8 mL) and the time left for this dose (30 minutes). The Total Remaining is the time left until the end of the last dose.

---

**Important** From any running or paused home screen, to view details about the programmed therapy, press **REVIEW/EDIT**. The Rx Details screen(s) appear. Viewing the Rx Details screens does not affect the current running therapy.

---

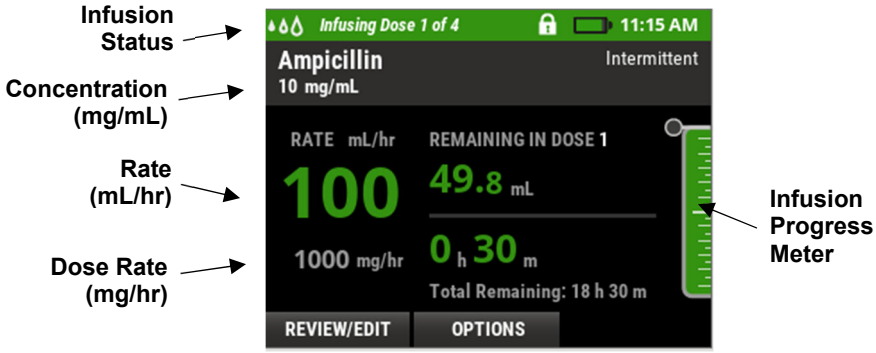



**Figure 8-2: Intermittent Therapy Home Screen (Dose being Infused)**

Figure 8-3 is an example of an Intermittent therapy home screen between doses (KVO being infused). Familiarize yourself with the information that is displayed.

The Active Program Area in the middle of the screen displays the remaining time before the next dose (5 hours, 59 minutes). The circle provides a visual indication of the KVO progression for between doses.


**Figure 8-3: Intermittent Therapy Home Screen (KVO being Infused)**

## Options: Intermittent-Specific Rx Tasks

**Note:** This section contains therapy-specific tasks.
General non-therapy-specific tasks, such as editing the current infusion, delaying the start of an infusion, priming, and others, are in other areas of the manual. See the Contents or Index.

### Setting or Changing the Next Dose Start Time

Should you need to maintain a specific dosing schedule and you want to initiate the first dose sometime in the future, you can program the start time through the Next Dose Start feature, otherwise the first dose will begin immediately upon RUN.

1. If the infusion is currently running press **PAUSE**.
2. Press **OPTIONS**.
3. Press ▼ to select **Rx TASKS**; press **SELECT**.
4. Press ▼ to select **NEXT DOSE START** (if it was previously programmed, the time is displayed; otherwise, it displays --); press **SELECT**.

   **Note:** Changing the next dose start time is not allowed if the last dose is currently running or if the infusion is complete.

5. Use numeric keypad to type new start time; press **OK**. The screen displays the time in hours and minutes until the next dose.
6. Press **CONFIRM**.
7. Press **RUN** to start the program. The pump will deliver at the programmed KVO rate until the dose begins.

If you change the next dose start time while a dose is in progress (instead of between doses), the remainder of the dose you are currently delivering will be cancelled, and a notification appears: NOTE: CURRENT DOSE WILL END. For more information, see “Notifications”, p. 143.

If you do not wish to cancel the remainder of the dose in progress, wait until the pump is in the KVO period between doses to change the next dose start time.

When editing the next dose start time, the start times for all subsequent doses will also be adjusted to maintain the programmed dose frequency. For example, the dosing schedule is 12am-6am-12pm -6pm. At 7am, the next dose start time is changed to 1pm. The new dosing schedule will be 1pm-7pm-1am-7am. The dose frequency of 6 hours is maintained.

## Resuming an Interrupted Intermittent Therapy

**Important**

If the pump is paused or interrupted during a dose, when the infusion resumes, the dose continues where it left off. All future doses are shifted forward by the amount of time the pump was paused or interrupted.

If the pump is paused between doses (during the KVO period) and the infusion resumes before the next dose is due, the start time of the following doses will not be affected.

If the pump is paused between doses and the infusion does not resume before the next dose is due, a DOSE IS LATE alarm message appears. Press **CONFIRM** to acknowledge the alarm and then press **RESUME**. The next dose immediately starts, and the remaining dose start times will shift forward.

If a dose is missed or interrupted for a long time, contact your health care provider for instructions on how to proceed.

For steps on resuming a therapy after pausing, see “Resuming an Interrupted Infusion”, p. 104.

## Repeating an Intermittent Therapy

If you make changes to an original therapy program (see “Editing the Current Rx”, p. 111) and then repeat it (see “Repeating the Current Rx”, p. 107), then in that repeated Rx:

- Some parameters will be repeated with their original values
- Other parameters will retain their edited values

Table 8-1 lists the Intermittent therapy parameters and how the pump uses those values during a repeated Rx.

**Table 8-1: Intermittent Therapy Rx Repeat Rules**

| Intermittent Therapy Parameters | Rx Repeat Rule |
|---|---|
| Bag Volume | Original value will always be repeated |
| KVO | Edited values will be repeated (if edit occurred) |
| Dose Frequency * | |
| Amount per Dose | |
| Dose Duration | |
| Dose Rate | |
| Number of Doses | |
| Total Dose | Recalculated based on repeated values |
| Total Volume | |
| Total Duration | |

* When repeating an Intermittent therapy, the dosing interval is maintained from the start of the original infusion’s last dose to the start of the repeated infusion’s first dose.

See “Repeating the Current Rx”, p. 107 for step-by-step instructions.

# Chapter 9. Variable Therapy Mode



Variable therapy allows you to program up to 24 steps of varying amounts, rates, and times of delivery (Figure 9-1). When running a Variable program, the pump will sound an alarm at the end of each step and automatically advance to the next step without user intervention.

A typical application of Variable therapy is IVIG (Intravenous Immunoglobulin) delivery.

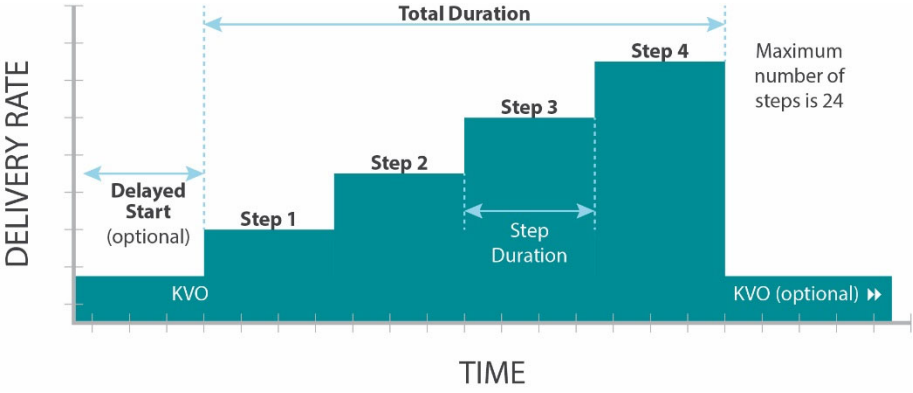



**Figure 9-1: Variable Therapy Graph**

**Important** For a list of all parameter definitions and ranges, see “Terminology and Definitions”, p.164.

## Variable Therapy Program Settings

| Parameter | Definition |
|---|---|
| Bag Volume | This is the actual volume of fluid that is contained in the IV bag/drug reservoir. The displayed value will decrease after priming and while the infusion is in progress.<br>When repeating an infusion program, the Bag Volume will be reset to the original bag volume amount.<br>Note: When determining the needed Bag Volume, the pharmacist should consider the +/- accuracy of the pump, the priming volume required for the chosen administration set, the volume needed for the KVO period, and the total dose amount (volume to be infused). |

| Parameter | Definition |
|---|---|
| KVO (Keep Vein Open) | The KVO rate is an optional setting. It is the rate at which the pump will be delivering during a delayed start and at the end of the infusion until the bag volume reaches zero.<br>The KVO is designed to maintain a patent catheter when the patient is connected to a running pump while a dose is not in progress. |
| # of Steps | The number of distinct combinations of amount, rate and duration that will make up the infusion profile.<br>Up to 24 steps may be programmed in one infusion profile. There is no restriction on increasing or decreasing step amounts from one step to another. |
| Step Amt TBI | The amount of medication to be delivered in a single step. Each step will contain a step amount, which may be unique from the other steps. |
| Step Rate | The rate at which the step amount will be delivered. Each step will contain a step rate, which may be unique from the other steps. |
| Step Duration | The length of time over which the step amount will be delivered. Each step will contain a step duration, which may be unique from the other steps.<br>The total duration of all steps combined in a single infusion profile must not exceed 288 hours. |
| Total Volume | The pump calculates this value and cannot be edited. It is the combined volume used to deliver the programmed steps.<br>The Total Volume is displayed on the final step programming screen. It will be displayed as “Total Volume” used out of the programmed Bag Volume. The Total Volume cannot be more than the Bag Volume. |

## Programming a Variable Therapy

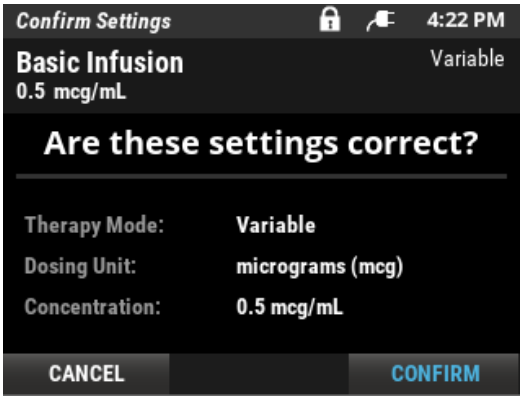

Most screens have help text associated with them. To view information about a specific screen, press **HELP**.

**Note:** If at any point during programming a therapy you press CANCEL, a notification appears: DISCARD EDITS? Any parameters you entered will not be saved.

Before you program a therapy, verify, or add patient information (see Chapter 4, CURLIN 8000 Programming, p. 39). Then follow these steps:

1. In the Select Therapy Mode screen, press ▼ to select **VARIABLE**; press **NEXT**.
2. Press ▼ or ▲ to select the dosing unit; press **NEXT**.
3. If you selected mg or mcg, use the numeric keypad to enter the concentration (mg/mL or mcg/mL); press **NEXT**.

   Otherwise, go to step 4.
4. A screen will appear (see below) asking if the settings are correct. If correct, press **CONFIRM.**




5. In the Enter Parameters screen, use the keypad to enter the **Bag Volume**; press **OK**.
6. Use the keypad to enter the **KVO rate**; press **OK**. The default KVO infusion rate is "- -", which is 0.0 mL/hr.

**Important** In the next step, enter the total number of steps to be delivered from the Bag Volume. This number sets the number of step programming screens that will subsequently display.

7. Use the keypad to enter the **# of Steps**, 1 to 24 individual programs or doses; press **OK**.

8. Press **NEXT** to view the Enter Step #1 of x screen, where “x” is the number of steps you entered.
9. From this screen, you must enter two of the three values for Step Amt TBI, Step Rate, and Step Duration; the third is calculated automatically. To skip a value, press ▼; otherwise, use the keypad to enter the value; press **OK**.
10. Press NEXT. Repeat step 8 for each step in this therapy. After entering the values for the final step, the total volume that has been programmed to be delivered out of the total bag volume programmed will be calculated and displayed.
11. A PROGRAMMED SAVED notification will appear and then the RxDetails screen will appear.
12. Check the entered parameter values. If there is more than one Rx Details screen, press **NEXT** to view additional ones.

    If you need to make changes to the infusion program, press **EDIT Rx**. Repeat steps 5 through 12. (If the dose unit or concentration is incorrect, will need to reprogram the entire therapy. Press **EXIT**, then select **PROGRAM**, **NEW Rx (Program)** and start a new therapy program.)
13. If the infusion therapy information is correct, press **NEXT** to view the Infusion Summary screen.
14. This therapy is now saved in the pump. You can:
    - Familiarize yourself with the information displayed on a typical Variable therapy home screen. Continue with the next section.
    - Set up any of the available options for this therapy. See “Options: Variable-Specific Rx Tasks”, p. 82.
    - Install and prime the administration set tubing and start the therapy immediately or at a future time (delayed start). Continue with Chapter 10, Administration Sets and Priming, p. 85.
    - Power off the pump. The saved patient and infusion program will be available when the pump is powered back on.

## Variable Therapy Home Screens

Figure 9-2 is an example of a Variable therapy home screen during an infusion step. Familiarize yourself with the information that is displayed.

The top of this screen displays the infusion status, which changes depending on what is being delivered. This example shows that the infusion is currently running (animated drops) and that step 3 of 4 is currently being infused. Other infusion statuses include Delay and Infusing Constant Rate.

The header bar will show either Basic Infusion (if the program was entered manually), or the drug name (if the program is a PSP). The Active Program Area in the middle of this screen displays the remaining volume for the current step (90.7 mL for Step 3), the time remaining in the current step (55 minutes for Step 3), and the Total Remaining time until the end of the last step (not including optional KVO).

**Important** From any running or paused home screen, to view details about the programmed therapy, press **REVIEW/EDIT**. The Rx Details screen(s) appear. Viewing the Rx Details screens does not affect the current running therapy.


**Figure 9-2: Variable Therapy Home Screen (Step being Infused)**

Figure 9-3 is an example of a Variable therapy home screen during a delayed start (KVO). Familiarize yourself with the information that is displayed.

The middle of the screen displays the remaining time before the start of the first step (1 hour, 1 minute). The circle provides a visual indication of the KVO progression.


**Figure 9-3: Variable Therapy Home Screen (Delay: KVO being Infused before First Step)**

## Options: Variable-Specific Rx Tasks

**Note:** This section contains therapy-specific tasks. General non-therapy-specific tasks, such as editing the current infusion, delaying the start of an infusion, priming, and others, are in other areas of the manual. See the Contents or Index.

### Changing a Variable Therapy to a Constant Rate

You may need to change a Variable therapy in progress to deliver the remaining medication at a constant, continuous rate. The new constant rate must be higher than the current KVO rate.

**Note:** Once you change a Variable therapy to a constant rate, you cannot change it back to a variable delivery. If you try and edit the constant rate Variable therapy parameters, the # of Steps parameter displays "--" and cannot be changed.

1. While the Variable therapy is infusing, press **PAUSE**.
2. Press **OPTIONS**.
3. Press ▼ to select **Rx TASKS**; press **SELECT**.

4. Press ▼ to select **SET CONSTANT RATE**; press **SELECT**.

   The pump will display the Set Constant Rate screen. The pump displays the amount remaining from the original programmed total amount to be infused, the current step rate, and the calculated duration. The Amt TBI, Rate, and/or Duration may be edited. It may be left at the current rate, decreased or increased.

   **Note:** The Set Constant Rate feature is not available if the infusion is complete.

5. From the Set Constant Rate screen, use the keypad to edit the desired field(s) if necessary; press **OK**. Once the program has been set to a constant rate, it cannot be reverted to a step program.

**Note:** If you change the constant rate to a value less than the KVO rate, a notification appears: KVO RATE RESET. Because the KVO rate cannot be higher than the constant rate, the KVO rate is automatically adjusted to match the constant rate. For more information, see “Notifications”, p. 143.

6. Press **CONFIRM**. A notification appears: SETTING SAVED.
7. Press **RESUME**.

**Note:** The pump screen displays **Infusing Constant Rate** (Figure 9-4). If you repeat this therapy, the original Variable therapy program will be repeated without the constant rate.

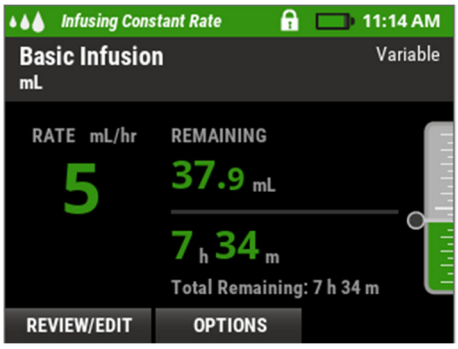



**Figure 9-4: Variable Therapy Home Screen (After Changing to a Constant Rate)**

## Repeating a Variable Therapy

If you make changes to an original therapy program (see “Editing the Current Rx”, p. 111) and then repeat it (see “Repeating the Current Rx”, p. 107), then in that repeated Rx:

- Some parameters will be repeated with their original values
- Other parameters will retain their edited values

Table 9-1 lists the Variable therapy parameters and how the pump uses those values during a repeated Rx.

**Table 9-1: Variable Therapy Rx Repeat Rules**

| Variable Therapy Parameters | Rx Repeat Rule |
|---|---|
| Bag Volume | Original value will always be repeated |
| KVO | Edited values will be repeated (if edit occurred) |
| Step Amt. TBI | |
| Step Rate | |
| Number of Steps | |
| Step Duration | Recalculated based on repeated values |
| Total Volume | |
| Total Dose | |
| Total Duration | |

**Note:** When repeating a Variable program after setting a constant rate, the constant rate will not be repeated. The program will repeat using the pre-constant rate program according to the rules in Table 9-1.

See “Repeating the Current Rx”, p. 107 for step-by-step instructions.

# Chapter 10. Administration Sets and Priming

A number of distinctively designed CURLIN administration sets are available to deliver each prescription accurately. Sets are constructed with a variety of components such as air eliminating filters, check values, and y-sites. Always select appropriate administration set according to therapy and drug manufacturer guidelines.

---

**Caution** Before use, patients and caregivers must be educated on the use of the CURLIN 8000 pump, accessories, and administration sets by a qualified health care provider. A qualified health care provider should monitor the patient throughout the use of the pump.

---

Detailed instructions for use are included with each administration set.

---

**Warning** Always read and follow specific instructions for use provided with the administration set.

---

For a list of available administration sets, see “Administration Sets”, p. 131.

---

**Warning** The administration set contains small parts such as caps, which could be a choking hazard. Keep all small parts away from children.

Use only approved CURLIN administration sets. The 340-XXXX series of CURLIN Administration sets cannot be used in the CURLIN 8000 pump. The use of non-CURLIN administration sets could result in air infusion, under delivery, over delivery or free flow, and could result in patient harm.

---

## Spike Sets

Spike sets contain either a non-vented bag spike or a vented bag spike (for vials) and can be used with a variety of IV bag sizes or rigid containers.

**Figure 10-1: Spike Set Example**

## Prepping the Administration Set

**Warning** Visually inspect the administration set before use:
- Do not use administration sets that are damaged or appear to be tampered with.
- Do not use if package seal is broken, if the caps are removed from the tubing, if the white slide clamp(s) is closed, or if the break-away tab is missing from the yellow flow-stop.
- Do not use the administration set beyond its recommended life or beyond its use by date.

1. Open the package and unwrap the IV tubing.
2. With the slide clamp closed, twist (do not snap) and remove the breakaway tab from the yellow flow-stop.
3. To maintain sterility, keep the blue cap on the distal Luer during setup, while priming, and until ready to connect to the patient's catheter.

## Priming the Administration Set

Priming is the process of filling the tubing with medication and removing air before connecting the tubing to the patient.

There are two ways of priming the administration set:

- **Gravity Priming:** Complete before installing the administration set into the pump (see “Gravity Priming”, p. 87).
- **Priming Using the Pump:** Complete after installing the administration set into the CURLIN 8000 (see “Priming Using the CURLIN 8000”, p. 92).

**Note:** For instructions on priming after an air in line alarm, see “High Priority Alarms”, p. 157.

Depending on the administration set, you may or may not be able to perform gravity priming. If the administration set has an in-line anti-siphon valve, you must prime using the pump. If the set does not have an in-line anti-siphon valve, you can perform either gravity priming or priming using the pump.

## Gravity Priming

**Warning** Maintain aseptic technique while interacting with the administration set. Do not touch either uncapped end of the administration set (the spike or Luer) and do not allow either to touch any surface. Doing so may contaminate the administration set and result in an increased infection risk to the patient.

The first steps of gravity priming are unique to the administration set type. First, follow the steps in the table according to the administration set you are using, then continue with the steps after the table.

| Administration Set | Initial Gravity Priming Steps |
|---|---|
| Spike Set | If an add-on bag check valve (R-lock check valve) is provided, connect it to the Luer connector before priming.<br>a. Remove protective cover from outlet port on medication bag/reservoir. Hold port with your non-dominant hand and insert the spike into port until it is fully inserted. Do not touch the spike while inserting into the port. Do not use if spike punctures medication bag/reservoir or port.<br>b. If the bag will not be hung from an IV pole throughout the infusion, all air in the bag must be removed. To do so, turn the bag upside down during priming so that air is at the top and can exit through the tubing port. |

For all administration set types, continue with the following steps:

1. Open the slide clamp(s).
2. Manual priming for bag or spike sets: To remove air from the bag, gently squeeze the inverted bag while simultaneously pinching the yellow flow-stop. Continue priming until all air has been removed from the administration set (and bag if applicable). Fluid should be visible throughout the length of tubing from the bag/reservoir to the Luer connector.

**Note:** Administration sets with filters: The set you are using may contain an air-eliminating filter. If the set has a filter, refer to the administration set instructions for use for proper orientation of the filter during the priming steps. When priming is complete, it is normal to see air on the upstream side of the filter (smooth side). Air should not be visible on the downstream side of the filter. Do not use the set if air is passing through the filter after priming.

---

**Warning** If using tape to secure the administration set to the patient, do not place tape over the 0.2 or 1.2 micron filter. This could block the filter vent and prevent it from working properly leading to improper medication delivery. (Refer to the administration set pouch to determine if your set contains a filter.)

**Caution** Use of air eliminating filters below 1 mL/hr can result in under delivery variation up to -18%.

---

3. Release the yellow flow-stop and manually close the white slide clamp.
4. Continue with the next section, “Installing the Administration Set into the CURLIN 8000”.

## Installing the Administration Set into the CURLIN 8000

### Open the CURLIN 8000 Door

1. With the pump screen facing you and the top of the pump upwards, pull the door latch (labeled **LIFT TO OPEN**) up.
2. Grasp the door latch and pull upwards and to the right to open the entire door. Pull the door latch downward until it stops.

### Install the Administration Set

1. Hold the administration with your right hand near the blue tubing guide and your left hand near the yellow flow-stop (Figure 10-4).

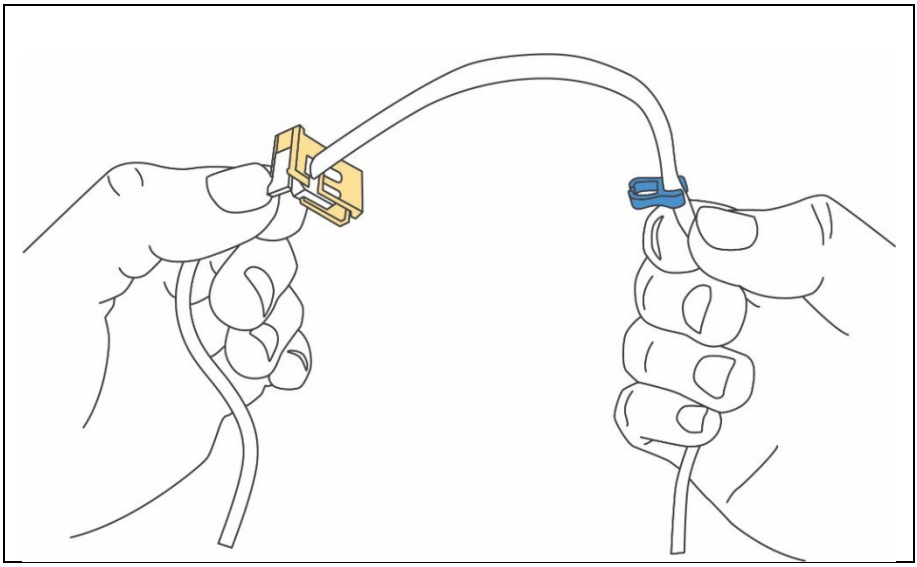


**Figure 10-2: Proper Hand Position to Install the Administration Set**

2. Insert the blue tubing guide into the hole on the right side of the pump, where the blue arrow is pointing (Figure 10-5).
3. Without pressing down on the top of the yellow flow-stop, insert the yellow flow-stop clamp into the square hole on the left side of the pump, where the yellow arrow is pointing (Figure 10-5).

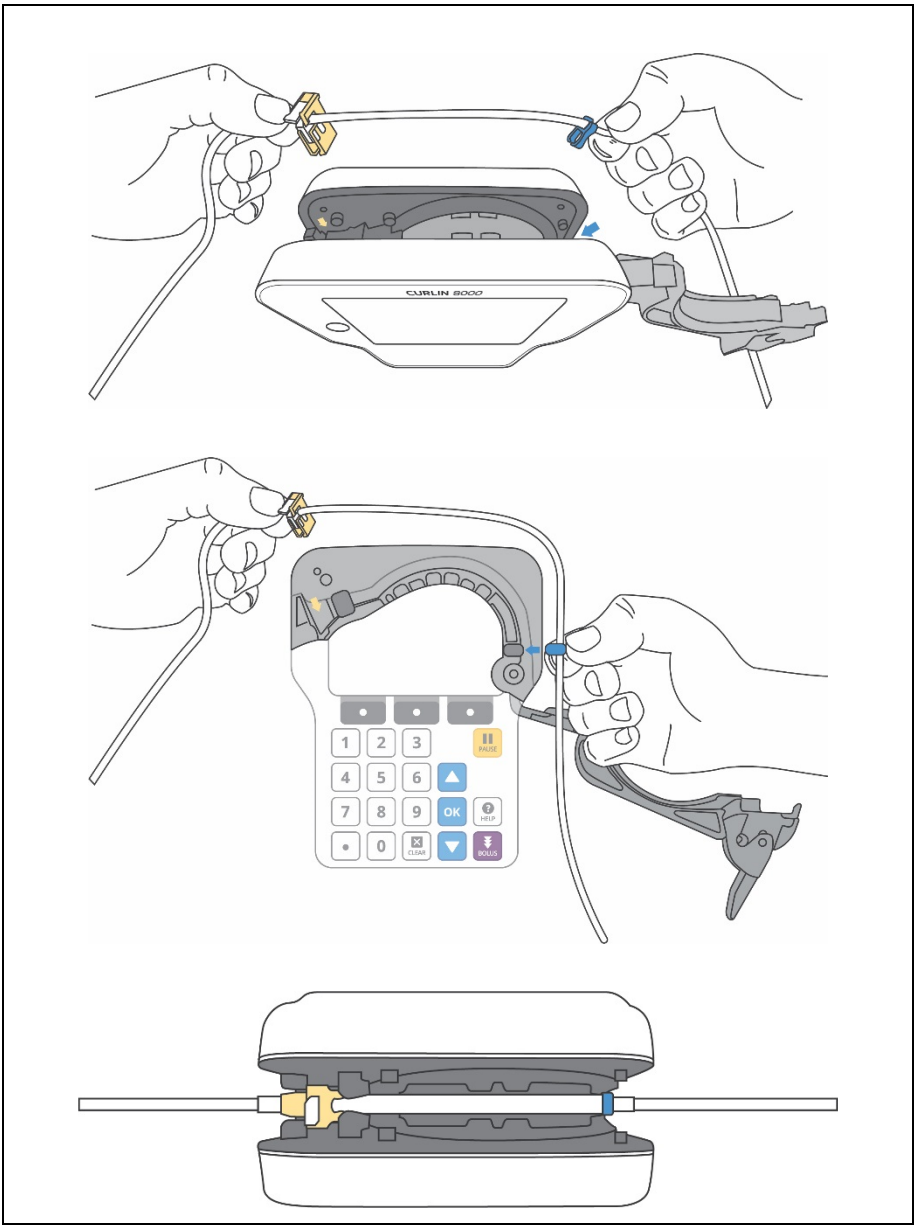



**Figure 10-3: Administration Set Installation**

4. There are spaces on either side of the door hinge where it attaches to the pump. These spaces allow the tubing to remain free flowing (not pinched) when the door is closed. Move the tubing to either side of the hinge before closing the door.
5. Ensure that the tubing is placed down the center of the pumping chamber as shown in the bottom image of Figure 10-5.

### Close the CURLIN 8000 Door

1. Holding the door latch (labeled **LIFT TO OPEN**), lift the entire door assembly up and to the left, then push downward until it is in its closed position.
2. Push the door latch down until it locks.

   **Note:** The door should lie flat in line with the top of the pump. It should not rub against the pump when closing. If the door appears to be out of line with the pump or appears to not close all the way, do not proceed. Attempt to reopen and close the latch and door. If the issue persists, do not use the pump.

3. If you did not gravity prime the administration set, continue with the next section, “Priming Using the CURLIN 8000”. Otherwise, continue with Chapter 11, Infusion Start and Finish, p. 95.

## Priming Using the CURLIN 8000

Each time before connecting the administration set to the patient, check to see if the administration set has been primed (all the air is removed). If air remains in the set, the pump's Prime function will assist in this process.

**Note:** Pump priming generally requires the user to enter the access code. Patients and caregivers should be instructed on the method of priming they will be performing. Considerations should include patient's/caregiver's abilities and understanding of the priming techniques. Also consider the lock level the pump is set to, and the patient's permission level related to priming (per PSP setting).

The pump must be paused and disconnected from the patient before priming.

---

**Warning** Never prime the set while it is connected to the patient. Before connecting the administration set to the patient, check to see if the administration set has been primed and all the air is removed. Failure to properly prime could result in patient injury.

**Caution** The pump has an infusion accuracy of +/- 5% at all flow rates above 1 mL/hr, under nominal operating conditions (see pg. 185 for further accuracy guidance). Consider the system accuracy and priming volume needs when determining how much overfill to include in the IV bag. Failure to do so may result in the bag volume running out before the completion of the infusion program.

---

To prime the set, follow these steps:

1. If the administration set is connected to the patient: disconnect the administration set from the patient's access site using aseptic protocols.
2. Release clamps on the administration set, if closed.
3. Make sure the pump is powered on.
4. If you just powered on the pump, at the Verify Patient screen, make sure the correct patient is listed and press **CONFIRM**.
5. From the Select Patient's Rx screen, press ▼ to select the infusion program (if there is more than one); press **SELECT**.
6. Review the Rx Details screen(s); press **NEXT**.
7. Press **PRIME**. A notification appears: DISCONNECT FROM PATIENT.
8. Press **CONFIRM**.
9. Press and hold down **PRIME** to start priming.

**Important** The amount of drug/fluid used for the prime session is accumulated and displayed on the bottom field of this screen. Press and hold **PRIME** up to 5 mL; then if needed, release and press **PRIME** again to prime more than 5 mL. Continue to prime until all the air has been removed between the medication reservoir (bag/) and the end of the tubing, which will connect to the patient.

10. When priming is complete, release **PRIME**.
11. Press **DONE**.

    **Note:** If the bag volume is insufficient to complete the entire infusion therapy after priming, a notification appears: CHECK BAG VOLUME. You can start the infusion therapy, but the bag volume will reach zero before the prescribed amount is delivered to the patient. Contact your health care provider for further instructions.

    If the programmed bag volume reaches zero during priming, a notification appears: BAG VOLUME IS ZERO. For more information, see “Notifications”, p. 143.

12. Close the clamp on the administration set.
13. Connect the administration set to the patient’s access site using aseptic protocols.

**Caution** When possible, bring the medication/solution to room temperature prior to starting the infusion to minimize Air In Line alarms.

14. Depending on when you want to start the infusion, continue with one of the following sections in Chapter 11, Infusion Start and Finish:
    - “Delaying the Start of a Continuous, TPN, or Variable Therapy Infusion”, p. 95
    - “Setting the Intermittent Therapy Next Dose Start Time”, p. 98
    - “Starting the Infusion Immediately”, p. 99

# Chapter 11. Infusion Start and Finish

**Warning** Do not use the CURLIN 8000 with a pressure cuff connected to the IV bag or medication reservoir bag and do not improperly squeeze or compress the bag during infusion. This could result in over-infusion, and possibly damage the pump.

Monitor the IV site (catheter location) frequently. If any signs or symptoms of infiltration or inflammation are noted at the infusion site, stop the infusion, and report it to the health care provider.


Most screens have help text associated with them. To view information about a specific screen, press **HELP**.

## Delaying the Start of a Continuous, TPN, or Variable Therapy Infusion

After programming a Continuous, TPN or Variable therapy, you can set the infusion start time to begin in the future.

You must set the delayed start before running (starting) the therapy. If the Continuous, TPN, or Variable therapy is already running, the Delay Start option is disabled. If a Delay Start is still desired, select OPTIONS; Program; Repeat Current Rx. Then set the delay start before initiating the infusion by following the steps below.

**Important** In order to initiate the delayed start, you must start the infusion at the end of these steps. Make sure that you have verified the patient information on the pump, the administration tubing is properly installed into the pump, the administration set is primed, and the administration tubing is properly attached to the patient before you initiate the infusion with a delayed start.

1. From the Infusion Summary screen, press **OPTIONS**.
2. Press ▼ to select **Rx TASKS**; press **SELECT**.
3. Press ▼ to select **DELAY START**; press **SELECT** to view the Delay Start screen.

**Important** You can delay the start up from 1 minute to 23 hours 55 minutes. If the delay is 0 minutes or is more than 23 hours 55 minutes, a notification appears: TIME EXCEEDS LIMIT. Adjust the time within the accepted range.

If the time displays in 24-hour format, a time less than 12:00 is in the morning; a time greater than 12:00 is in the afternoon. For example, if it is currently 9:45 AM and you want to delay the start 4 hours from now, you would type **1345**. If the time is in 12-hour format, press **AM/PM** to select either AM (morning) or PM (afternoon).

4. Using the keypad, enter the time in the future that you want the infusion therapy to begin; press **OK**.

   The screen displays when the infusion will begin (today or tomorrow) and in how many hours and minutes from now (Figure 11-1, Figure 11-2).

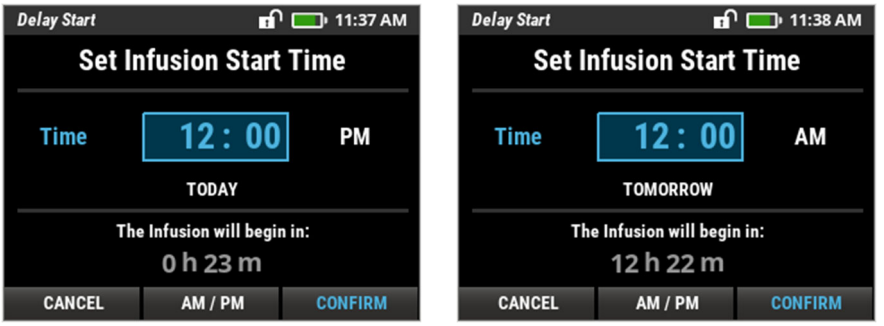



**Figure 11-1: Set Infusion Start Time Screens; 12 Hour Format, Showing Difference in AM/PM Selection**

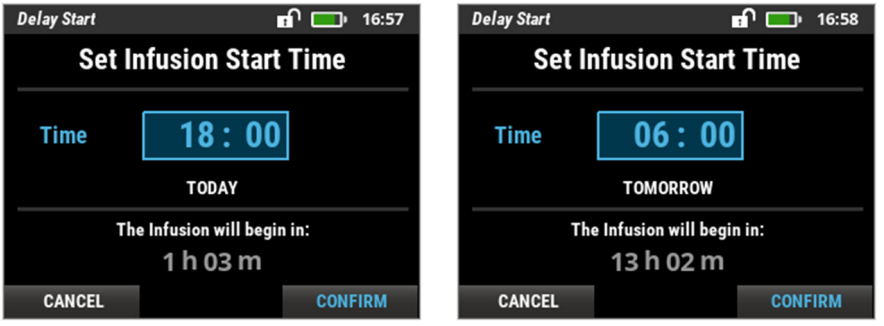



**Figure 11-2: Set Infusion Start Time Screens; 24 Hour Format**

5. Press **CONFIRM**. The Settings Saved screen message displays, then the Options screen appears.
6. Press **EXIT**. The Infusion Summary screen appears.
7. Release clamp on the administration set.
8. Press **RUN** to start the delay countdown. If KVO is programmed, the KVO rate begins immediately (Figure 11-3).

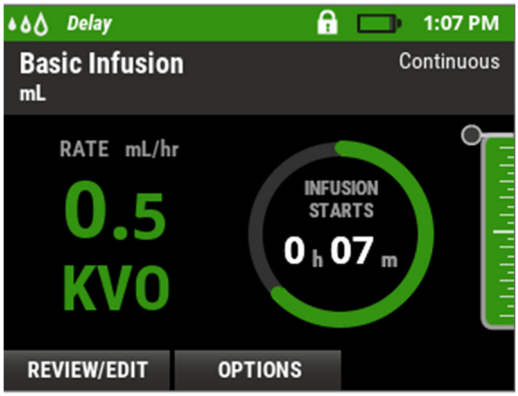



**Figure 11-3: Delay Screen (KVO Programmed)**

## Setting the Intermittent Therapy Next Dose Start Time

After programming an Intermittent therapy, you can set the infusion start time to begin in the future.

You must set the next dose start time before running (starting) the therapy. If the Intermittent therapy is already running, the Next Dose Start option is disabled.

---

**Important** Make sure to verify the programmed therapy and patient information on the pump, properly install the administration tubing into the pump, prime the administration set, and properly attach the administration tubing to the patient's catheter before you initiate (RUN) the delayed start. In order to initiate the delayed start, you must start the infusion at the end of these steps.

Changing the next dose start time while a dose is in progress will stop and cancel the remainder of the current dose. To avoid this, Moog Medical recommends waiting until the pump is in the KVO period to change the next dose start time.

---

1. From the Infusion Summary screen, press **OPTIONS**.
2. Press ▼ to select **Rx Tasks**; press **SELECT**.
3. Press ▼ to select **NEXT DOSE START**; press **SELECT**.
4. Using the keypad, enter a time in the future that you want the infusion therapy to begin; press **OK**.
5. If the time for the pump is in AM/PM, press AM/PM to change that value.
6. Press **CONFIRM**. A Settings Saved screen message displays, then the Options screen appears.
7. Press **EXIT**. The Infusion Summary screen appears.
8. Release clamp on the administration set.
9. Press **RUN** to start the delay countdown.

## Starting the Infusion Immediately

Starting a programmed therapy is the same for one programmed using the pump, “Basic programming”, or a PSP downloaded from the RxManager.

---

**Warning** Never prime the set while it is connected to the patient. Before connecting the administration set to the patient, check to see if the administration set has been primed and all the air is removed. Failure to properly prime could result in patient injury.

**Caution** Do not stretch the tubing of the administration set or leave the tubing in the CURLIN 8000 for more than 24 hours when the pump is not running.

---

1. Make sure that:
   - The pump is powered on
   - You have verified the patient and therapy information to ensure they are correct
   - The administration set is primed and connected to the patient’s access site

---

**Warning** If your administration set includes an in-line 0.2 or 1.2 micron air eliminating filter, avoid raising the filter above the height of the patient’s catheter entry point while infusing. The catheter entry point is the location on the patient’s body where the IV catheter is inserted. Raising the filter up above this height can cause the filter contents to drain into the patient causing unintentional delivery of medication.

---

2. Release the slide clamp on the administration set.
3. On the Infusion Summary screen, press **RUN** to start the infusion.

   For a PSP only: If there are any clinical advisories, they will display. Advisories are extra reminders that the pharmacist attached to this PSP. Advisories remind the user to do something, be aware of something, or monitor something. All advisories are customized by the prescribing facility. Press **CONFIRM** to acknowledge each advisory.

   **Note:** If a delayed start is programmed, the pump will begin to infuse at the set time. If a KVO is programmed, this will begin immediately, and the Delay home screen will count down the time until the infusion therapy starts (Figure 11-4).


**Figure 11-4: Delay Home Screen with KVO (Basic Program)**

If there is no delayed start, the Infusing home screen appears (Figure 11-5). This screen will continue to provide the infusion details throughout the infusion. The Infusion Progress Meter on the right side of the screen provides a graphic representation of the infusion progression.

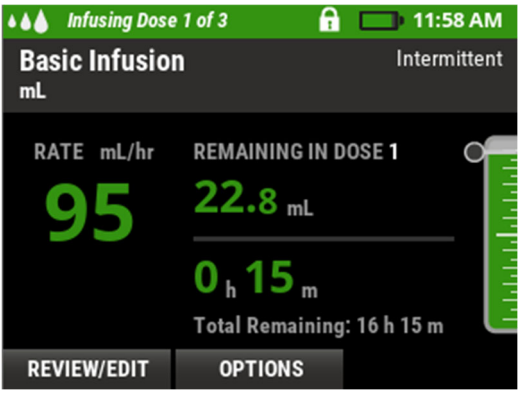



**Figure 11-5: Infusing Home Screen (Basic Program)**

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**Warning** Tubing could pose a trip hazard. Coil and secure excess amounts of tubing to prevent it from catching on a person or object, leading to the IV being pulled from the patient.

Tubing, power cable, and bolus cable could pose a strangulation hazard. Patients who could potentially become entangled should be under continuous observation. Coil and secure excess amounts of tubing to prevent entanglement.

---

4. During the infusion, you can change the device settings to customize the pump for the user, such as changing the audio level and screen brightness.

For more information, see “Customizing User Preferences (Device Settings)”, p. 123.

---

**Important** When the infusion is complete, the audible alarm will beep periodically (every 5 minutes if there is KVO and every 2 minutes if there is no KVO) to alert the user. Additionally, the infusion status indicator lights blink to alert you to the status of the pump. The red and green lights blink when the KVO rate is infusing (if KVO is programmed). The red light will blink to indicate that the infusion is complete.

All Basic infusions have End of infusion Escalation enabled. This option is available for PSPs. For Basic infusions or if End of Infusion Escalation was enabled for the PSP, the Infusion Complete audible alarm will beep with increasing alarm volume.

For non-PCA infusions, the pump will display INFUSION COMPLETE on an orange and black screen (Figure 11-6).

For PCA infusions, the pump will display BAG EMPTY on an orange and black screen (Figure 11-6).

After 2 minutes of no response, the pump will sound a louder (escalating), repeating alarm. To clear the alarm, press CONFIRM on the INFUSION COMPLETE or BAG EMPTY screen.

---

5. When the infusion is complete and the amount to be infused is delivered, the INFUSION COMPLETE or BAG EMPTY screen appears (Figure 11-6 and Figure 11-7). The pump will alarm and stop, or it will continue to infuse if a KVO rate was programmed, and the programmed bag volume has not reached zero. Press **CONFIRM**. Either the Completed screen or the Infusion Complete KVO screen appears (Figure 11-8 and Figure 11-9).


**Figure 11-6: End of Infusion Escalation Enabled: Infusion Complete (non-PCA) and Bag Empty (PCA) Screens**


**Figure 11-7: End of Infusion Escalation Disabled: Infusion Complete (non-PCA) and Bag Empty (PCA) Screens**

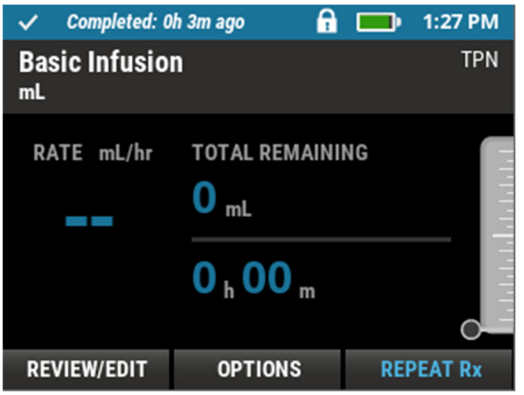


**Figure 11-8: Completed Screen (Infusion Complete without KVO)**

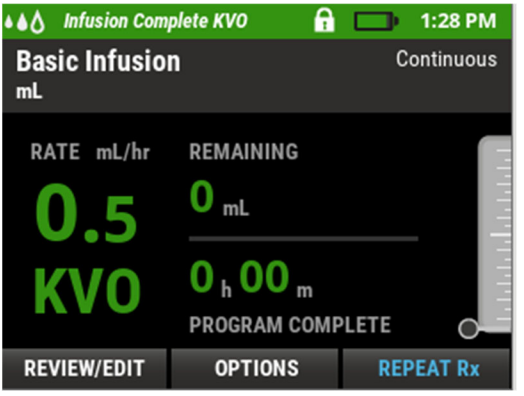


**Figure 11-9: Infusion Complete KVO Screen (Infusion Complete with KVO)**

6. If the patient does not require another infusion, disconnect the administration set from the patient and dispose of the administration set per protocol.

   If you need to repeat the infusion, press **REPEAT Rx**. Review the Rx Details screen(s). Connect a new IV bag and administration set and prepare the administration set. See Chapter 10, Administration Sets and Priming, p. 85.

   - If the prescription does not need to be changed, press **NEXT** and then press **RUN**.
   - If you need to make changes to the existing prescription, press **EDIT Rx**.

   If you need to select a different program (a PSP and Basic Program can be programmed into the pump at the same time), press **OPTIONS**, then select **PROGRAM**, **NEW Rx**. From the Select Patient's Rx screen, press ▲ or ▼ to select the desired prescription (it will have a blue background), then press **SELECT**. Review the Rx Details screen(s). Connect a new IV bag and administration set and prepare the administration set. See Chapter 10, Administration Sets and Priming, p. 85.

## Pausing or Stopping an Infusion Before it is Complete

There may be instances where you need to pause or stop an infusion before it finishes, such as a patient reaction or emergency, the patient needs to shower, you need to address a problem with the administration set, or a physician changes the infusion orders.

If you need to make changes to the parameters of an infusion therapy already running, you must press PAUSE first.

- To stop an infusion that is currently running, press **PAUSE**.

**Note:** The pump will alert you every two minutes while the infusion is paused and no buttons are pressed. This is to remind you to restart the infusion when ready.

If the pump is powered down while an infusion is in progress, when the pump resumes power, you must first verify the patient information. The pump infusion status will be paused. Then you can restart the infusion. See “Resuming an Infusion after a Power Loss”, p. 104.

## Resuming an Interrupted Infusion

After the pump is paused, to continue the infusion, press **RESUME**. The pump will start infusing immediately.

## Resuming an Infusion after a Power Loss

During an infusion therapy, if the batteries run out of power or if the AC power is lost, follow these steps to resume the therapy:

1. After replacing the batteries or when AC power is restored, press the On/Off button to power on the pump. The Verify screen appears.
2. If information is correct, press **CONFIRM**. The pump displays the Paused home screen.
3. Press **RESUME** to continue the infusion. The infusion will continue from where it left off.

## Disconnecting the Administration Set

**Warning** Maintain safe clinical practice and always close the slide clamp on the administration set before removing the administration set from the pump to prevent over-delivery of medication.

When the infusion is complete, or if you need to replace the administration set:

1. Close the slide clamp on the administration set.
2. Disconnect the administration set from the patient's catheter.
3. Follow your health care provider's instructions for flushing the catheter.
4. Clamp catheter as directed.
5. Open the pump door, remove the administration set, and close the pump door.
6. Dispose of the administration set as instructed by your health care provider.

## Powering Off the CURLIN 8000

When you power off the pump, the current patient and that patient's infusion program is retained.

**Note:** If you try to power off the pump while an alarm message is displayed, a notification appears: CONFIRM ALARM. Resolve the alarm condition and confirm it. For more information, see "High Priority Alarms", p. 155. Then power off the pump.

If you try to power off the pump while it is infusing, a notification appears: INFUSION IN PROGRESS.

1. If the pump is currently infusing, you must pause the infusion before powering it off. Press **PAUSE**.
2. Press and hold the On/Off button. The POWER DOWN notification displays, then the pump screen is blank, indicating the pump is off.
3. Release the On/Off button.

# Chapter 12. Common Options



After the prescription is programmed and the patient is verified, there are programming options available for all therapy modes. The features described in this chapter are accessed from the Options screen (Figure 12-1).


Most screens have help text associated with them. To view information about a specific screen, press **HELP**.

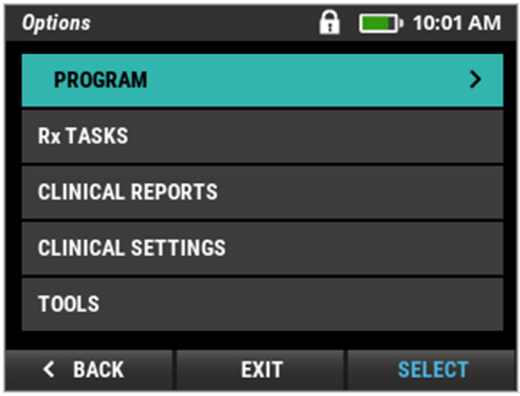


**Figure 12-1: Options Screen**

Depending on the therapy mode and status of the program, all options may not be available at all times. For example, Repeat Rx will not be available if the programmed infusion has not yet been initiated (placed in RUN mode). The OPTION NOT AVAILABLE notification will appear if the user attempts to access a feature not currently available.

## Repeating the Current Rx

Once an infusion therapy is complete and you confirm it, you can repeat the same therapy. For example, you may want to do this when you are hanging a new infusion bag using the same Rx program. Or you may need to repeat an infusion from the beginning when it has not reached Infusion Complete on the status bar.

If you edited the infusion therapy and are repeating it, some edited parameter values will revert to their original values. Other edited parameter values will be repeated. The auto calculated parameters are recalculated (such as Duration or Total Volume), based on the repeated values. Sometimes, this combination causes an auto calculated value to be outside of the system limit. When this happens, a notification appears: REPEAT Rx NOT ALLOWED.

Reference the following tables, which define the parameters that will be repeated with their original values and the parameters that will retain their edited values when you repeat a therapy.

- Table 5-1: Continuous Therapy Rx Repeat Rules, p. 49
- Table 6-2: PCA Therapy Rx Repeat Rules, p. 60
- Table 7-1: TPN Therapy Rx Repeat Rules, p. 67
- Table 8-1: Intermittent Therapy Rx Repeat Rules, p. 76
- Table 9-1: Variable Therapy Rx Repeat Rules, p. 84

1. From the Completed screen (Figure 12-2), press **REPEAT Rx** to view the Rx Details screen(s). Or, from the Options screen, select **PROGRAM**, then **REPEAT Current Rx**.

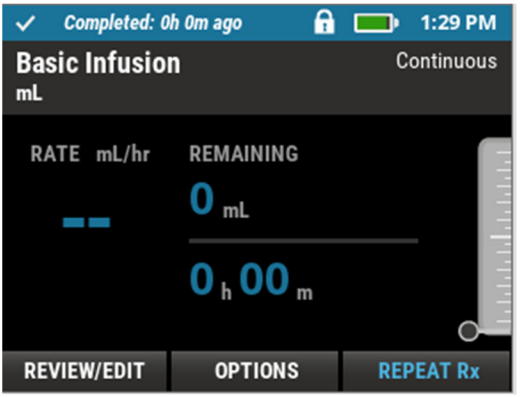


**Figure 12-2: Completed Screen**

2. Review the infusion information and verify that you do not need to make any changes.
3. Press **NEXT**.
4. Continue with Chapter 10, Administration Sets and Priming, p. 85.

**Note:** To repeat an infusion from the beginning when it has not reached infusion complete, press **PAUSE**. Then press **OPTIONS**, select **PROGRAM**, then select **REPEAT Current Rx**. A confirmation message is displayed, explaining that the current infusion is incomplete. Press **YES**, then press **NEXT**, then **RUN**. The Repeat Current Rx feature is not available if the infusion has not been started.

## Starting a Pre-Programmed Rx (New Rx)

Once an infusion therapy is complete and you confirm it, you can select and start a programmed therapy. If there are two therapies programmed into the pump (both PSP and Basic), you can select either to start.

1. From the Completed screen (Figure 12-2), press **OPTIONS**.
2. Select **PROGRAM**, then press ▼ to select **NEW Rx (Program)**; press **SELECT**.

3. From the Select Patient's Rx screen, press ▼ or ▲ to highlight the infusion program you want to run. (The selected infusion program will have a blue background. In Figure 12-3, the Basic Infusion is selected.)

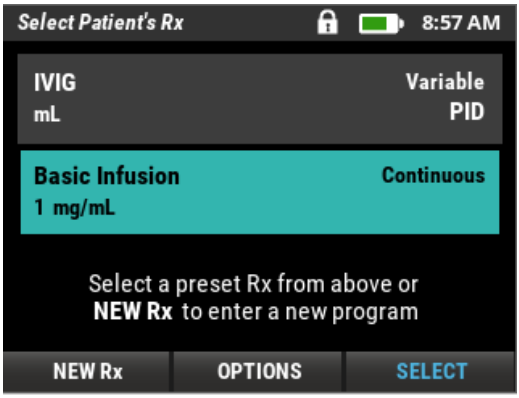


**Figure 12-3: Select Patient's Rx Screen (PSP and Basic Program Listed)**

4. Press **SELECT**.
5. Review the Rx Details screen(s) and verify that you do not need to make any changes.
6. Press **NEXT**.
7. Continue with Chapter 10, Administration Sets and Priming, p. 85.

## Starting a New Patient and Therapy

**Important** When you start a program for a new patient, the existing patient's information, therapy programming (PSP and Basic Programming), and patient-specific report information is erased.

1. From the Options screen, press **SELECT** to select **PROGRAM**.
2. Press ▼ to select **NEW PATIENT**; press **SELECT**. A notification appears, NOTE! NEW PATIENT SELECTED, confirming you want to erase the existing patient information.

   **Note:** Depending on the Lock Level, you may need to enter an Access Code.

3. Press **NEW** to view the Enter Patient Info. screen.
4. Use the numeric keypad to enter a Patient ID or press **SKIP**.
5. Press **NEW Rx** to view the Select Therapy Mode screen.
6. See the appropriate therapy chapter for specific basic programming information.

| For Basic Programming of: | Continue with: |
|---|---|
| Continuous Therapy | Chapter 5, p. 45 |
| PCA Therapy | Chapter 6, p. 51 |
| TPN Therapy | Chapter 7, p. 61 |
| Intermittent Therapy | Chapter 8, p. 69 |
| Variable Therapy | Chapter 9, p. 77 |

## Programming a New Basic Program

In order to program a new Basic therapy, a patient must be verified (infusion not started) or the current infusion must be paused to stop a current therapy and create a new Rx.

If the pump is already loaded with a PSP for the current patient, you can program a Basic infusion for that same patient and the PSP is retained in the pump. Two infusion therapies (PSP and Basic) can be saved in the pump for one patient and either can be selected to run.

If the pump is already loaded with a Basic program for the current patient, the new Basic program will erase the existing one. One Basic program can be saved in the pump for one patient.

1. From the Options screen, press **SELECT** to select **PROGRAM**.
2. Press ▼ to select **NEW Rx (Program)**; press **SELECT**.

**Note:** Depending on the Lock Level, you may need to enter an Access Code.

3. A notification appears: DELETE CURRENT Rx?

   If you press **YES**, the current Basic program will be erased. The Select Therapy Mode screen appears. Continue with step 4.

   Press **NO** to return to the Select Patient's Rx screen.

4. See the appropriate therapy chapter for specific basic programming information.

| For Basic Programming of: | Continue with: |
|---|---|
| Continuous Therapy | Chapter 5, p. 45 |
| PCA Therapy | Chapter 6, p. 51 |
| TPN Therapy | Chapter 7, p. 61 |
| Intermittent Therapy | Chapter 8, p. 69 |
| Variable Therapy | Chapter 9, p. 77 |

## Editing the Current Rx

There may be instances where you need to make changes to an infusion program.

**Note:** If at any point during editing a program you press CANCEL, a notification appears: DISCARD EDITS? Any parameters you changed will not be saved.

After you change a programmed infusion therapy, the Rx Details screens indicate the changed values with a pencil icon. In Figure 12-4, the Bag Volume and Dose Frequency were changed from their original values.

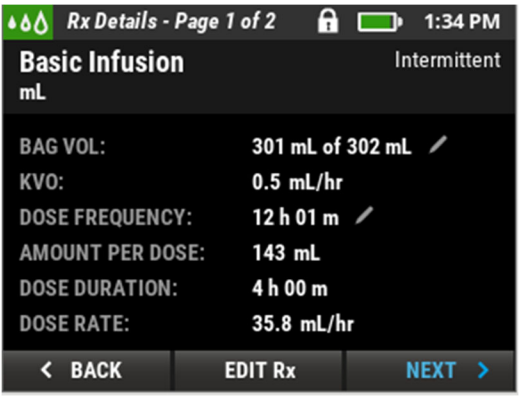


**Figure 12-4: RxDetails Screen with Changes from Original Program**

## Editing a Therapy Before Infusion Start

1. After verifying the patient information, from the Select Patient's Rx screen, select the therapy you want to edit (there could be a single PSP or Basic therapy or both currently programmed).
2. From the Rx Details screen, press **EDIT Rx**. Depending on the Lock Level, you may need to enter the Access Code using the numeric keypad.
3. Make any changes to the values in the Enter Parameters screens, then press **CONFIRM**. A PROGRAM SAVED notification appears.
4. Press **NEXT** to review the Rx Details screens until the Infusion Summary screen appears.
5. Your therapy edits are now saved. You can either:
   - Power off the pump.
   - Prepare the pump for infusion. Continue with Chapter 10, Administration Sets and Priming, p. 85.

## Editing an In-Progress Infusion Therapy

If the infusion therapy is in progress, you can review the current Rx details first to determine if a change is necessary. During an in-progress infusion, you must pause the infusion delivery before you can change the therapy parameters.

To review the current Rx details and then edit the in-progress therapy:

1. From the Infusion home screen, press **REVIEW/EDIT** to view the RxDetails screens.
2. Press **NEXT** to scroll through multiple screens.
3. If you need to make changes to the in-progress therapy, press **PAUSE**.
4. Press **EDIT Rx** to view the Enter Parameters screens.

   **Note:** Depending on the Lock Level, you may need to enter the Access Code.

5. Make any changes to the values in the Enter Parameters screens, then press **CONFIRM**. A PROGRAM SAVED notification appears.
6. Press **RESUME** to continue the infusion therapy.

To edit the in-progress therapy without reviewing the current Rx details:

1. Press **PAUSE**.
2. Press **OPTIONS**.
3. Press ▼ to select **RxTASKS**; press **SELECT**.
4. Press **SELECT** to select **EDIT Current Rx** and view the Enter Parameters screens.

   **Note:** Depending on the Lock Level, you may need to enter the Access Code.

5. Make any changes to the values in the screens, then press **CONFIRM**. A PROGRAM SAVED notification appears.
6. Press **RESUME** to continue the infusion therapy.

**Notes:** The Edit Current Rx feature is not available in the RxTasks menu if an infusion has not yet been selected on the Select Patient's Rx screen. You cannot edit a program that has reached Infusion Complete. You can make edits to the program after selecting **Repeat Rx**.

When editing an "in-progress infusion", the VTBI will reflect the remaining bag volume.

## Priming the Administration Set from the RxTasks Screen

In most cases when you need to prime the administration set, one of the soft keys will provide access to the priming feature (for example, prior to running the infusion for the first time or when an Air In Line alarm is present). If you need to prime the administration set at other times during the infusion, this option is available under the RxTasks menu. The Prime feature is unavailable in the RxTasks menu if the infusion has not been started or if it has reached Infusion Complete.

1. Press **PAUSE**.
2. Press **OPTIONS**.
3. Press ▼ to select **RxTASKS**; press **SELECT**.
4. Press ▼ to select **PRIME**; press **SELECT**.
5. Continue with “Priming Using the CURLIN 8000”, step 7, p. 92.

## Canceling the Infusion Delay

If you set a Continuous, TPN, or Variable infusion to start at a time in the future and the infusion has not started yet, follow these steps if you want to cancel the infusion time delay:

1. If the Delay screen is displayed, you need to pause the infusion first. Press **PAUSE** (Figure 12-5).

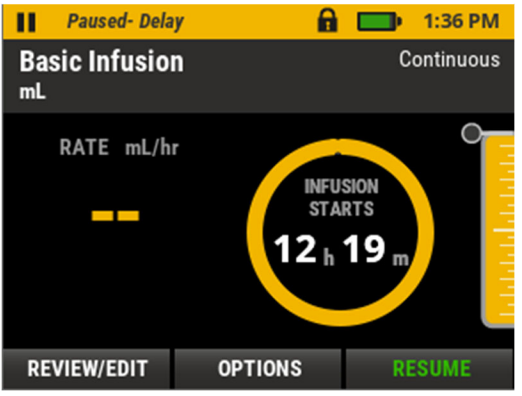


**Figure 12-5: Paused - Delay Home Screen**

2. From the Infusion Summary home screen or Paused - Delay home screen, press **OPTIONS**.
3. Press ▼ to select **RxTASKS**; press **SELECT**.
4. Press ▼ to select **CANCEL CURRENT DELAY**; press **SELECT**. A notification appears: SETTING SAVED, then either the Paused screen appears, or the Options screen appears (from the Options screen, press **EXIT** to view Infusion Summary screen).

5. See Chapter 10, Administration Sets and Priming, p. 85, for steps to ensure that the administration set is ready.



## Viewing Clinical Reports

Several reports are available for you to view from the pump. You can view the reports during a running or paused infusion. All reports are automatically cleared when a new patient is programmed.

**Note:** Reports are not updated while you are viewing them. For example, if a bolus is requested while you are viewing the Infusion Totals report, the data will not be updated on that view of the report. To see the updated value, you must exit the report and re-select it.

Some clinical reports may not be available unless there is an active infusion, such as from the Verify Patient screen or Select Patient's Rx screen.

1. From the Options screen, press ▲ or ▼ to select **CLINICAL REPORTS** and then press **SELECT**.
2. Press ▲ or ▼ to select and display the results of the following reports. When you are finished viewing a report, press **EXIT**.

### Rx Details

This report displays the current program settings and patient information (if available). Edits made to original settings are indicated with a symbol of a pencil.

### Infusion Totals

This report shows up to 12 days' worth of the amount given by various means (e.g., dose, bolus type, or KVO) and how much was primed since the displayed date and time. The amounts continue to be added until either the infusion is repeated or when it is manually cleared by pressing **CLEAR**. Clear this report as needed to monitor infusion totals for the period of time between shifts or as needed per Rx being infused.

When infusion totals are cleared, the cleared values are recorded in the Patient History report.

**Note:** If you press OPTIONS from the Select Patient's Rx screen and attempt to access this report, a notification appears: OPTION NOT AVAILABLE. You must first select the Patient's Rx you wish to review.

### Hourly Totals

This report provides an hour-by-hour view of the amount given for the last 24 hours. The PCA therapy mode also shows a breakdown of given amounts by bolus type and number of boluses given and attempted. The information is for the current patient and includes totals only for the current Rx program. When a new Rx Program or new patient is selected, this report is automatically cleared.

If a selected line contains **>**, press **OK** or **DETAILS** to view more information about the amount given that hour.

**Note:** If you press OPTIONS from the Select Patient's Rx screen and attempt to access this report, a notification appears: OPTION NOT AVAILABLE. You must first select the Patient's Rx you wish to review.

## Patient History

This report shows events for the current patient for the last 32 days. This report tracks Patient and Rx Program setup and infusion event data. The report is cleared when the selection of New Patient is confirmed.

**Note:** The patient history log may take a few seconds to load.

- Press **PAGE >** or **PAGE <** to move or backward or forward in time.
- To review an event, press ▲ or ▼ to select the event. If a selected line contains **>**, press **OK** to view details about that event.
- Press **PREVIOUS** or **NEXT** to move backward or forward within viewing the details.
- Press **EXIT** when you are finished.

**Note:** Events logged on the pump (e.g., alarms and infusion data) are maintained in a circular queue in non-volatile memory.

The log will maintain a minimum of 90 days of events. The oldest events are over-written when the log is full.

All patient-identifying data is encrypted and cannot be retrieved unencrypted from the pump.

### Pressure Trend

This graph depicts the approximate downstream pressure readings for the current patient for up to four hours (Figure 12-6).

| This line: | Indicates: |
|---|---|
| Red dashed | The level to which the downstream occlusion is currently set. |
| Green | The downstream pressure reading. |

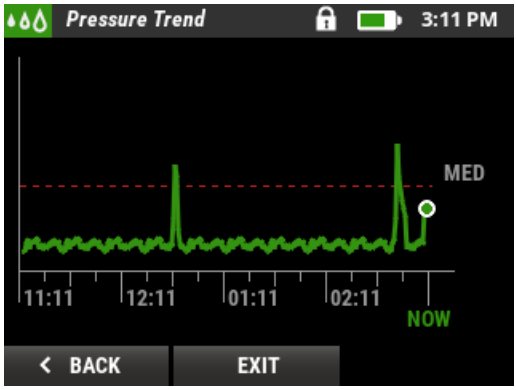


**Figure 12-6: Pressure Trend Report Example**

## Changing the Clinical Settings

Clinical settings provide the prescribing facility with the means to customize the pump considering the needs of the patient and the prescribed therapy. Clinicians should understand the implications of changing these settings and should follow their facility's policies before making any changes.

Each pump is programmed with default clinical settings using the RxManager (Lock Level, and Occlusion Sensitivity, and Air In Line Sensitivity). For Basic programs, the default clinical settings are defined in the pump configuration. For PSPs, the clinical settings are selected during PSP creation. Once a Basic program is saved in the pump or a PSP is loaded onto a pump, you can change access and edit most clinical settings for a specific patient. An access code is generally required to change clinical settings.

For Basic programming, your clinical setting updates will remain on the pump until you start a new patient and therapy, which clears the pump of the current patient's information, and the clinical settings go back to their configuration default values.

For PSPs, your clinical setting updates will remain on the pump until either a new PSP is uploaded to the pump, or you start a new patient, which clears the pump of the current patient's information, and the clinical settings go back to their configuration default values.

## Setting the Lock Level

The lock level determines which features can be accessed without entering the access code. One (1) is the least restrictive; 3 is the most restrictive. Off allows a user to access to all the pump features and functions without entering the code. The pump must be unlocked in order to change the lock level.

---

**Caution** Lock level setting “OFF” should be reserved only for situations where a clinician is present and monitoring the pump for the entire infusion.

---

The pump automatically locks:

- When an infusion starts
- After the pump is powered off, then on
- After 2 minutes of inactivity (no keypad presses)

Table 12-1 defines the lock levels and lists which features are controlled under which lock settings.

To change the lock level:

1. Press **OPTIONS** to view the Options screen.
2. Press ▲ or ▼ and select **CLINICAL SETTINGS** and then press **SELECT** to view the Clinical Settings screen.
3. Press ▲ or ▼ and select **LOCK LEVEL** and then press **SELECT** to view the Lock Level screen (Figure 12-7).

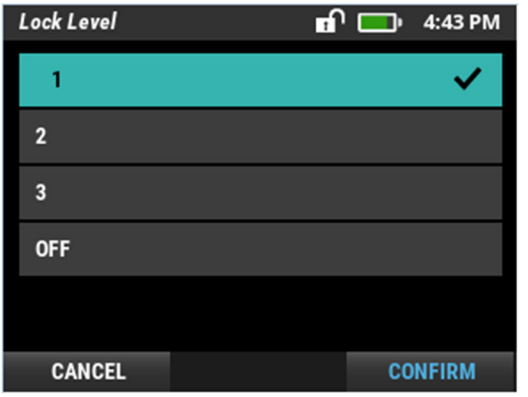


**Figure 12-7: Lock Level Screen**

4. Press ▲ or ▼ and select the level you want and then press **CONFIRM** to set the lock level. A notification appears: SETTING SAVED.

In Table 12-1:

- A cell with a checkmark indicates that the correct access code must be entered in order to perform the feature.
- A cell without a checkmark indicates that the feature is available without entering an access code.

**Table 12-1: Lock Level Definitions**

| CURLIN 8000 Feature | Location | Active Therapy | Lock OFF* | Lock 1 | Lock 2 | Lock 3 |
|---|---|---|---|---|---|---|
| General Functions | | | | | | |
| Power Pump Off | -- | All | | | | |
| Run/Pause/Resume Infusion | Home screen | All | | | | |
| Access Help screens | Most screens | All | | | | |
| Silence Alarm | Alarm screen | All | | | | |
| Confirm Alarm | Alarm screen | All | | | | |
| Initiating/Running an Rx Program | | | | | | |
| Verify Patient | Power up | All | | | | |
| Select Patient's Active Rx | Select Pt's Rx screen | All | | | | |
| Select Patient's Inactive Rx | Select Pt's Rx screen | All | | | | ✓ |
| Options | | | | | | |
| View Options | Most screens | All | | | | |
| Repeat Current Rx | Program | All | | | | ✓ |
| Enter Initial Basic Rx | Program | All | | | ✓ | ✓ |
| Enter a New Basic Rx (Delete current Basic program) | Program | All | | ✓ | ✓ | ✓ |
| Enter New Patient (when no patient exists) | Program | All | | | | |
| Enter New Patient (Delete Current Patient) | Program | All | | ✓ | ✓ | ✓ |
| Edit Rx: PSP Program | Rx Tasks | All | | Within limits | ✓ | ✓ |
| Edit Rx: Basic Program | Rx Tasks | All | | ✓ | ✓ | ✓ |

| CURLIN 8000 Feature | Location | Active Therapy | Lock OFF* | Lock 1 | Lock 2 | Lock 3 |
|---|---|---|---|---|---|---|
| Prime Administration Set using the Pump | Rx Tasks | CON, INT, TPN, VAR | | | | Not required if Patient Prime is enabled in PSP |
| Prime Administration Set using the Pump | Rx Tasks | PCA | | ✓ | ✓ | ✓ |
| Deliver Clinician Bolus | Rx Tasks | | | ✓ | ✓ | ✓ |
| Pause, Resume or Cancel: Loading Dose, Clinician Bolus, or PCA Bolus | Bolus Specific screen | PCA | | | | |
| Edit Bolus Delivery Rate | Rx Tasks | PCA | | ✓ | ✓ | ✓ |
| Initiate Immediate Ramp Down | Rx Tasks | TPN | | | | |
| Program Constant Rate | Rx Tasks | VAR | | | ✓ | ✓ |
| Program Next Dose Start Time | Rx Tasks | INT | | | Not Required if Edit Next Dose Start Time is enabled in PSP | Not Required if Edit Next Dose Start Time is enabled in PSP |
| Delay Start of Program; Cancel Current Delay | Rx Tasks | CON, TPN, VAR | | | ✓ | ✓ |
| View Clinical Reports | Options | All | | | | |
| Clear Infusion Totals Report (cleared values saved in Patient History log) | Clinical Reports | All | | | | |
| Adjust Lock Level Setting | Clinical Settings | All | | ✓ | ✓ | ✓ |
| Adjust Occlusion Sensitivity Setting (for downstream occlusion) | Clinical Settings | All | | | ✓ | ✓ |
| Adjust Air in Line Sensitivity | Clinical Settings | All | | | ✓ | ✓ |

| CURLIN 8000 Feature | Location | Active Therapy | Lock OFF* | Lock 1 | Lock 2 | Lock 3 |
|---|---|---|---|---|---|---|
| View Device Settings | Tools | All | | | | |
| Change Audio Level | Tools | All | | | | |
| Change screen Brightness | Tools | All | | | | |
| Change Date and Time | Tools | All | | | | ✓ |
| View Device Info | Tools | All | | | | |

CONT = Continuous
INT = Intermittent
PCA = Patient Controlled Analgesia
TPN = Total Parenteral Nutrition
VAR = Variable

## Setting the Occlusion Sensitivity

The Occlusion feature allows the user to set the sensitivity level of the downstream occlusion sensor. The pump will sense an occlusion or blockage in the line between the pump and the patient's access site. When an increase in the downstream pressure reaches the set sensor value, the pump displays an alarm message on the screen and sounds an audible tone. Setting the sensor to a higher sensitivity will allow earlier detection of an occlusion. For more information refer to the Down Occlusion Detection Time information in the CURLIN 8000 Specifications table, p. 185.

For more information about alarm messages, see "High Priority Alarms", p. 155.

1. Press **OPTIONS** to view the Options screen.
2. Press ▲ or ▼ and select **CLINICAL SETTINGS** and then press **SELECT** to view the Clinical Settings screen.
3. Press ▲ or ▼ and select **OCCLUSION SENSITIVITY** and then press **SELECT** to view the Occlusion Sensitivity screen (Figure 12-8).

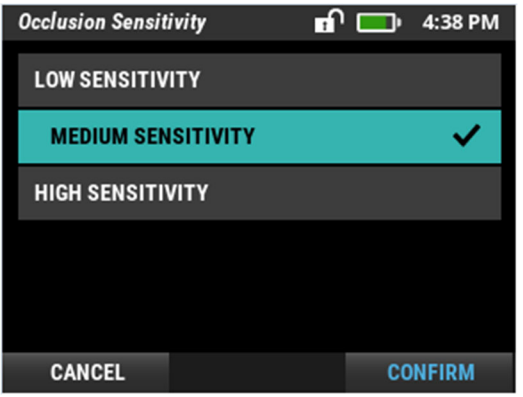


**Figure 12-8: Occlusion Sensitivity Screen**

4. Press ▲ or ▼ to select the pressure level you want, and then press **CONFIRM**:
   - LOW SENSITIVITY: (alarm will sound at approximately 900 mmHg pressure)
   - MEDIUM SENSITIVITY: (alarm will sound at approximately 400 mmHg pressure)
   - HIGH SENSITIVITY: (alarm will sound at approximately 250 mmHg pressure)

   A confirmation screen appears, and your selection is saved.

**Note:** When selecting HIGH SENSIVITY, the Downstream Occlusion alarm will likely be triggered if using the pump with an administration set containing an Anti-Siphon Valve (ASV). In this scenario, the user may not be able to deliver the infusion.

---

**Warning:** Monitor the IV site (catheter location) frequently. if any signs or symptoms of infiltration or inflammation are noted at the infusion site, stop the infusion, and report it to the health care provider.

---

## Setting the Air In Line Sensitivity

The Air In Line feature allows the pump to detect the amount of air in the administration set tubing as it passes through the pump. When the amount of air reaches the set threshold, the pump displays an alarm message on the screen and sounds an audible tone. For more information about alarm messages, see “High Priority Alarms”, p. 155.

1. Press **OPTIONS** to view the Options screen.
2. Press ▼ and select **CLINICAL SETTINGS**; press **SELECT** to view the Clinical Settings screen.

3. Press ▼ and select **AIR IN LINE**; press **SELECT** to view the Air In Line screen (Figure 12-9).

   **Note:** Depending on the Lock Level, you may need to enter the Access Code.

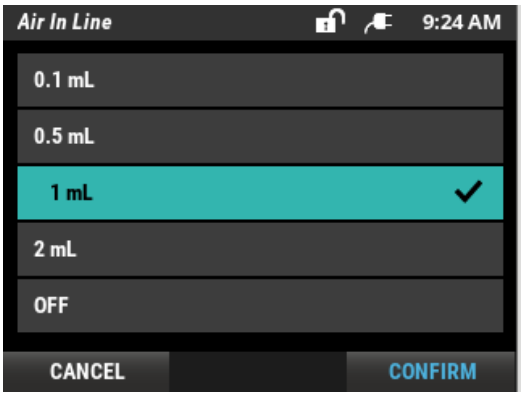


**Figure 12-9: Air In Line Screen**

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**Important** Clinicians should understand the impact of potential air delivery to their patient when choosing the air in line setting. If the setting is set to OFF, you must use an air eliminating filter. The pump will require confirmation of use of the filter each time there is an attempt to run the infusion.

**Caution** Use of air eliminating filters below 1 mL/hr can result in under delivery variation up to -18%.

---

**Note:** If you select the Air In Line sensor to OFF, a notification appears: DISABLE AIR DETECTOR? recommending the use of an administration set with an air eliminating filter. For more information, see “Notifications”, p. 143.

4. Press ▲ or ▼ and select the level of responsiveness you want, then press CONFIRM:

   - 0.1 mL, 0.5 mL, 1 mL, or 2 mL: (alarm will sound if 0.1 mL, 0.5 mL, 1 mL, or 2 mL of air is detected)
   - OFF: (alarm will sound if 3 mL of air is detected)

   A confirmation screen appears, and your selection is saved.

   **Note:** If you set the Air In Line sensor to off, a notification appears: CAUTION! AIR DETECTOR IS OFF. The user will be required to confirm that an air eliminating filter is in use. For more information, see “Notifications”, p. 143.

## Customizing User Preferences (Device Settings)

The pump's device settings are set by the pump configuration (for a Basic program) or from the PSP. After the pump is programmed for a patient's therapy, you can change different settings to customize it to the patient. You can change the default settings to customize the pump for a specific patient's needs, and they will be saved for this patient until the next new patient is programmed, either via Basic Programming at the pump or from a downloaded PSP.

You can customize various options of the pump via the Device Settings screen.

### Viewing the Device Settings Screen

1. Press **OPTIONS** to view the Options screen.
2. Press ▼ and select **TOOLS** and then press **OK** to view the Tools screen.
3. Press **SELECT** to select **DEVICE SETTINGS** to view the Device Settings screen (Figure 12-10). It displays the current device settings for audio level, date, and time.

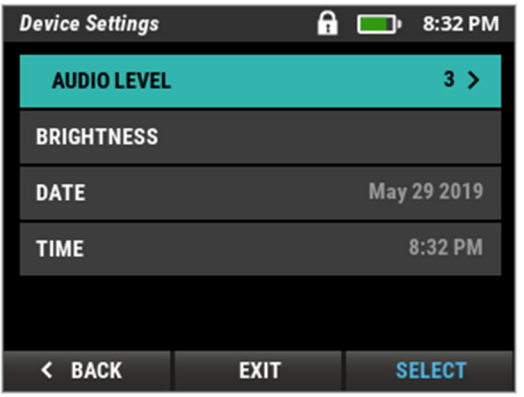


**Figure 12-10: Device Settings Screen**

### Setting the Audio Level

1. From the Device Settings screen, press **SELECT** to select **AUDIO LEVEL** to view the Audio Level screen (Figure 12-11).

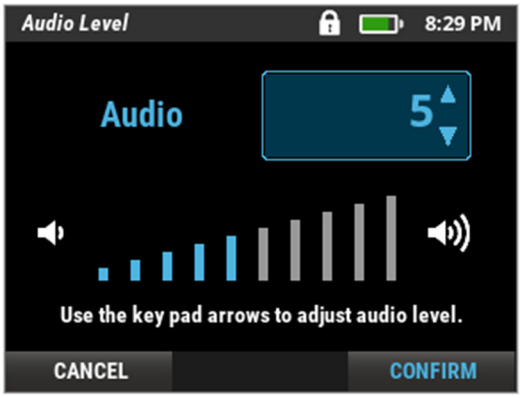


**Figure 12-11: Audio Level Screen**

2. Press ▲ or ▼ to adjust the audio level. The pump sounds the audio tone louder or quieter with each arrow button press.
3. Press **CONFIRM** to save the audio level. This is the level at which an audio starts. If an alarm is not acknowledged by pressing the appropriate button, the audio level continues to escalate (gets louder) to gain the user's attention.

## Setting the Screen Brightness

1. From the Device Settings screen, press ▲ or ▼ and select **BRIGHTNESS** and then press **SELECT** to view the Brightness Level screen.


**Figure 12-12: Brightness Level Screen**

2. Press ▲ or ▼ to adjust the brightness level. The screen brightness increases or decreases with each arrow button press.
3. Press **CONFIRM** to save the brightness level.

## Changing the Date and Time

The date and time are originally set at the pharmacy when the pump is connected to a computer running RxManager. Changing the date or time will not affect any dosing schedule, delivery limits or lockouts that are currently in place for a current protocol. For example, a dosing interval of 8 hours will remain 8 hours even if the time is changed.

**Note:** If you attempt to change the date or time during the following situations, a notification appears: OPTION NOT AVAILABLE:

- During Continuous, TPN, or Variable therapies, during an active or paused delay start
- During Intermittent therapy, during an active next dose start time/delay start
- During an active Intermittent therapy, while a dose or a KVO rate is being infused or paused

### Changing the Date

You can change the date on the pump by only one calendar day from its current date.

1. From the Device Settings screen, press ▲ or ▼ and select **DATE** and then press **CONFIRM** to view the Date screen (Figure 12-13).

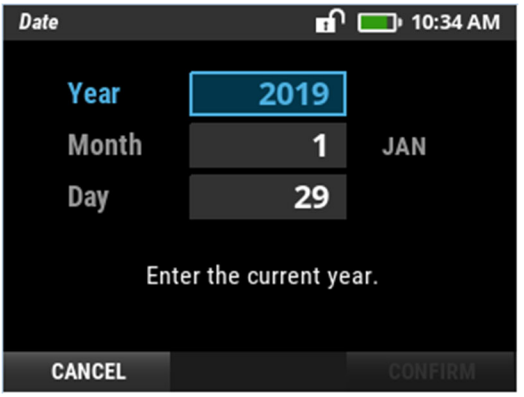


**Figure 12-13: Date Screen**

2. Press ▼ and the keypad to set the Day.
3. Press **CONFIRM** to set the date. The DATE/TIME CHANGE screen appears (Figure 12-14).

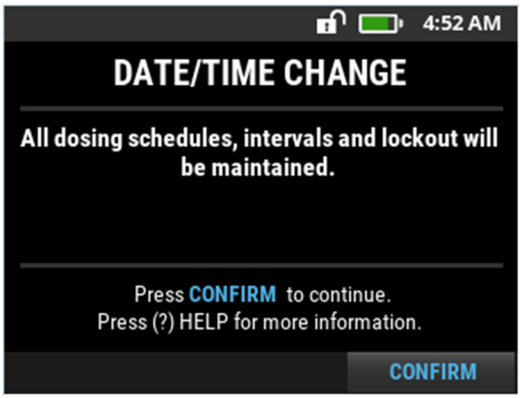


**Figure 12-14: DATE/TIME CHANGE Screen**

4. Press **CONFIRM** to save the date.

### Changing the Time

The pump time is set when the pharmacy configures the pump. You may need to change the time due to Daylight Savings. Changing the time does not affect the dosing schedule, delivery limits, or lockout time between boluses (for PCA therapies). When a time change is made, a change in time event is entered in the pump's Patient History report.

1. From the Device Settings screen, press ▲ or ▼ and select **TIME** and then press **CONFIRM** to view the Set Time screen (Figure 12-15).

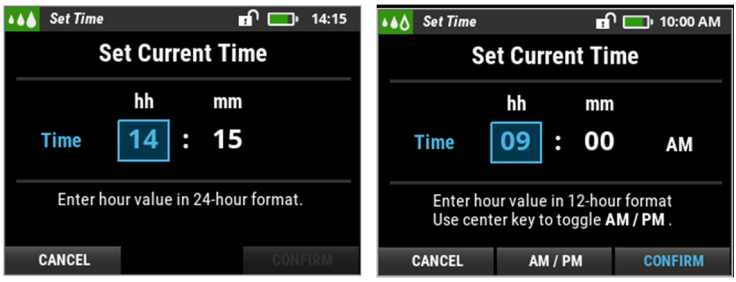


**Figure 12-15: Set Time Screens (24-hour and 12-hour formats)**

2. Use the numeric keypad to enter the correct hour of the day.

   (Optional for 12-hour format) Change AM/PM setting by pressing **AM/PM**.

3. Press **CONFIRM** to save the updated time.

## Viewing Device Information

The device information, such as the pump serial number and software and hardware version numbers can be displayed. Use this screen to verify the pump configuration and current date.

1. Press **OPTIONS** to view the Options screen.
2. Press ▼ and select **TOOLS**; press **SELECT** to view the Tools screen.
3. Press ▲ or ▼ and select **DEVICE INFO**; press **SELECT** (Figure 12-16).

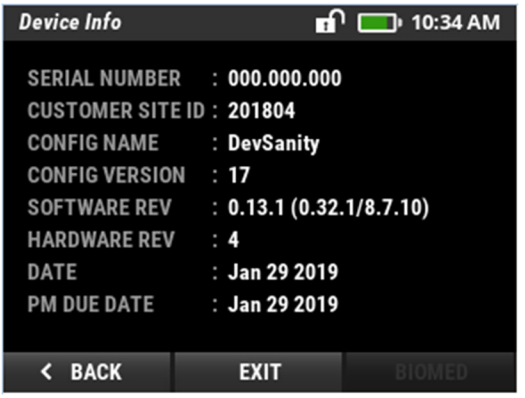


**Figure 12-16: Device Info Screen**

4. When you are finished, press **EXIT**.

## Testing the PCA Bolus Handset

You can test the functionality of the PCA bolus handset when you first power the pump on, before confirming the patient information. Once you confirm the patient information, this option is unavailable.

1. Press **OPTIONS** to view the Options screen.
2. Press ▼ and select **TOOLS**; press **SELECT** to view the Tools screen.
3. Press ▼ and select **PCA BOLUS HANDSET TEST**; press **SELECT** (Figure 12-17).

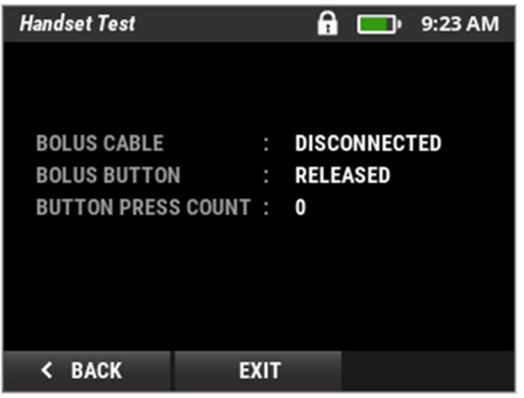


**Figure 12-17: Handset Test Screen**

The Handset Test screen displays the status of the PCA bolus cable (Connected or Disconnected), the state of the PCA bolus handset button (Pressed or Released), and the number of registered button presses using the handset.

4. When you are finished, press **EXIT**.

# Chapter 13. Accessories

The following accessories are available to use with the CURLIN 8000. Contact your service provider for more information.

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**Caution** Only use accessories recommended by Moog Medical. Use of non-recommended accessories may adversely affect the CURLIN 8000's operation.

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## AC Power Cord

The AC power cord, when attached from the pump to an electrical outlet, operates the pump without drawing from the disposable batteries or rechargeable battery pack. If the rechargeable battery pack is installed, it will be recharged during this connection.

---

**Warning** Make sure the external AC power cord plug is completely dry before and during use. Failure to do so may result in electric shock.

Do not submerge the pump or place the pump under running water when connected to external AC power. This may lead to electric shock or damage to the pump.

---

### Connecting/Disconnecting the External AC Power Supply

**Note:** If the pump is secured in a lockbox, the Power port is accessible from the left side of the lockbox.

1. Connect the AC power cord connector to Power port on the left side of the pump (Figure 2-3).
2. Connect the AC power cord power plug to the working power outlet.
3. Make sure that the blue light is ON below the Power port of the pump, which indicates that the pump is receiving power from the power outlet.

   **Note:** The pump can deliver the infusion while the rechargeable battery pack is charging in the pump.

4. When the infusion is complete, disconnect the power plug of the AC power cord from the working power outlet.
5. Disconnect the AC power cord connector from the pump.

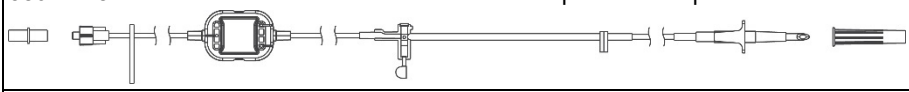
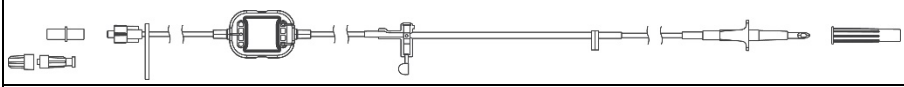
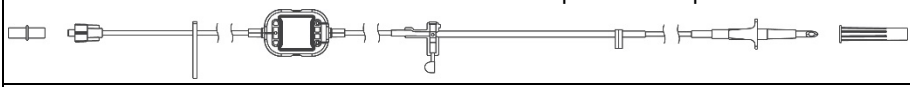
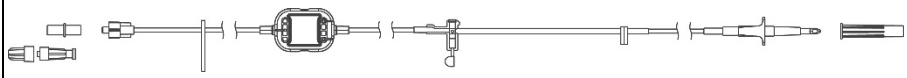
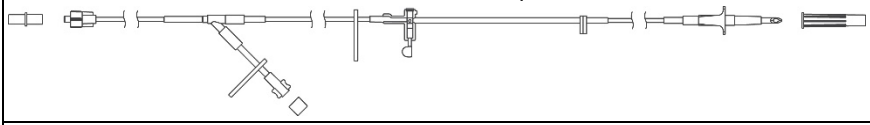
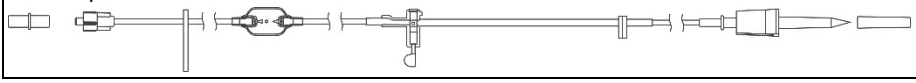
## Administration Sets

The administration set provides a sterile pathway to deliver the drug/fluid from the infusion container (e.g., IV bag/reservoir) to the distal connection that connects to patient's catheter/delivery site.

**Caution** Refer to the administration set instructions found in the packaging for the stated life of the administration set. Pump performance may be affected when exceeding the recommended duration of use.

Table 13-1 contains the available administration sets for use with the CURLIN 8000. Filtered sets are for special use only. All administration sets are non-DEHP, micro-bore, PVC, not manufactured with rubber latex and are intended for use only with CURLIN Infusion Pumps by Moog.

**Table 13-1: 380 Administration Sets**

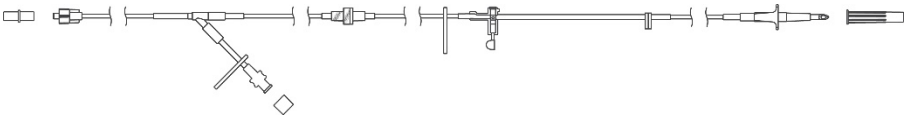
| |
|---|
| **380-4114** – Microbore Admin Set with Non-Vented Spike  |
| **380-4128** - Microbore Admin Set with Non-Vented Spike and 1.2µ Filter  |
| **380-4128V** - Microbore Admin Set with Non-Vented Spike and 1.2µ Filter, Check Valve  |
| **380-4130** - Microbore Admin Set with Non-Vented Spike and 0.2µ Filter  |
| **380-4130V** - Microbore Admin Set with Non-Vented Spike and 0.2µ Filter, Check Valve  |
| **380-4134** - Microbore Admin Set, Non-Vented Spike, Y-Site with Check Valve  |
| **380-4144** – Microbore Epidural Yellow Striped Tubing Admin Set, Vented Vial Spike and 0.2µ Filter  |

**380-4162** - Microbore Epidural, Yellow Striped Tubing Admin Set, Non-Vented Spike, Vented 0.2µ Filter

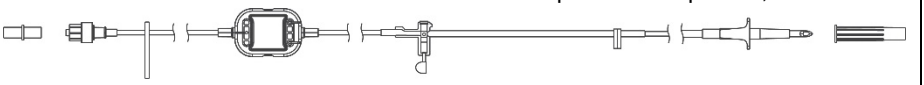
**380-4165** - Microbore Epidural, Yellow Striped Tubing Admin Set, Non-Vented Spike, Vented 0.2µ Filter, ASV

**380-4166** - Microbore Admin Set with Non-Vented Spike, ASV

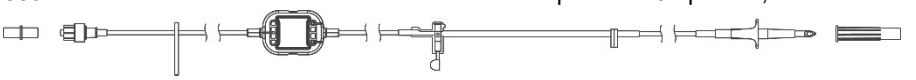
**380-4168** - Microbore Admin Set, Non-Vented Spike, Y-Site with Check Valve, ASV



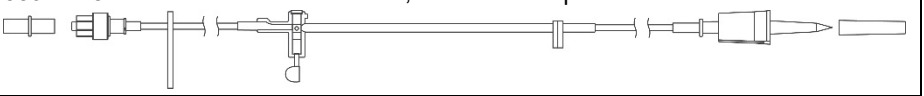
**380-4173** - Microbore Admin Set with Non-Vented Spike and 1.2µ Filter, ASV



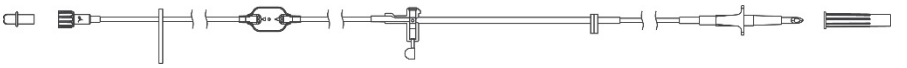
**380-4174** - Microbore Admin Set with Non-Vented Spike and 0.2µ Filter, ASV



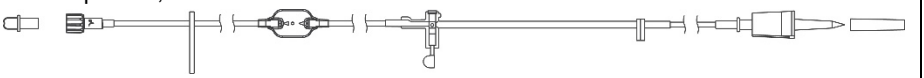
**380-4178** - Microbore ASV Admin Set, Vented Vial Spike



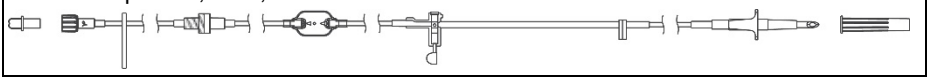
**380-4192** - Microbore Epidural Yellow Striped Tubing Admin Set, Non-Vented Spike, Vented 0.2µ Filter, NRFit connector



**380-4194** - Microbore Epidural Yellow Striped Tubing Admin Set, Vented Vial Spike and 0.2µ Filter, NRFit connector



**380-4195** - Microbore Epidural, Yellow Striped Tubing Admin Set, Non-Vented Spike, Vented 0.2µ Filter, ASV, NRFit connector



## Batteries and Rechargeable Battery Pack

Access the battery storage compartment from the back of the pump (Figure 2-2).

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**Caution** Do not short circuit, crush, heat above 80°C, incinerate, or disassemble the rechargeable battery.

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- The pump can be powered using two C-Cell batteries. Moog recommends Duracell® Procell® alkaline batteries.
- Factors that influence battery life are the number of times the screen is illuminated with a key press, the viscosity of the fluid being delivered, the age of the batteries, and the temperature at which the batteries have been stored. For more detailed battery life information, see Chapter 17, Technical Specifications, p. 176.
- Only the rechargeable battery pack (part number 56012-002) of the type that is included with the CURLIN 8000 can be used as an alternative source of power in place of the two C-Cell batteries.
- You can replace the batteries during an infusion without disrupting the infusion if the pump is connected to an external AC power supply (part number 56626).

---

**Caution** Batteries should be installed in the pump even when running on the external AC adapter. Use only the rechargeable battery pack or approved disposable C-Cell batteries.

---

### Replacing Batteries or Rechargeable Battery Pack

**Note:** If connected to external AC power, you can change the batteries without powering the pump off.

1. If the pump is running, stop the pump by pressing **PAUSE**; then press and hold the **ON/OFF** button until the pump screen goes blank.

   **Note:** If the pump is secured in a lockbox, the battery door is accessible from the back of the lockbox.

2. To open the battery door, from the back side of the pump, slide the lock on the battery door from left to right, then using your thumbs, grip and slide the door downward and remove.
3. Remove the batteries and inspect the battery terminals for signs of damage (contact health care provider if terminals are damaged).
4. Insert the new C-Cell batteries, making sure to place the positive (+) poles at the top and negative (–) poles of the batteries at the bottom.

Or

Insert a new rechargeable battery pack by holding the tab on the front of the pack and sliding it into the battery storage compartment.

5. Replace the battery door by sliding it on from the bottom towards the top of the pump. Slide the lock to the left to secure the door.

If the CURLIN 8000 is exposed to fluids, power off the device. Remove the battery door and remove the batteries. Remove fluid from pump and batteries using a clean, soft cloth. Reinstall the batteries and battery door and resume operation.

**Note:** The battery pack can be charged while installed in the pump by connecting the pump to the external AC power supply. It takes approximately 8 hours to fully charge a battery pack.



## Carrying Packs

Carrying packs are available for the patient to contain the pump and medication.

Purchase carrying packs directly from Triac Medical Products Plus, LLC:

Call 1-800-998-7422 or email sales@triacmed.com

The following carrying packs are compatible with the CURLIN 8000 Ambulatory Infusion Pump:

- T-2 Liter U
- T-500 U Shoulder
- TCCP-500

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**Caution** Do not overload carry packs with personal items as pump function may be affected by kinked or pinched tubing and/or unintentional button presses.

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## Data Cord

The data cord connects the pump to a computer that is running the RxManager. The data cord connector can be inserted in only one direction in the Bolus/Data port on the left side of the pump. The drop of fluid symbol and thumb rest indicate the front of the data cord connector.

Patient and pump logs are transferred from the pump to the RxManager, and PSPs can be uploaded to the pump from the RxManager.

## Holster and Pole Mount Bracket

The pump holster assembly, which consists of a holster and a pole mount bracket, is used to hold the pump onto an IV pole (Figure 13-1). The pole mount

bracket will work with poles from 5/8” to 1-3/8” in diameter. The pump can be easily placed into and removed from the holster as needed.

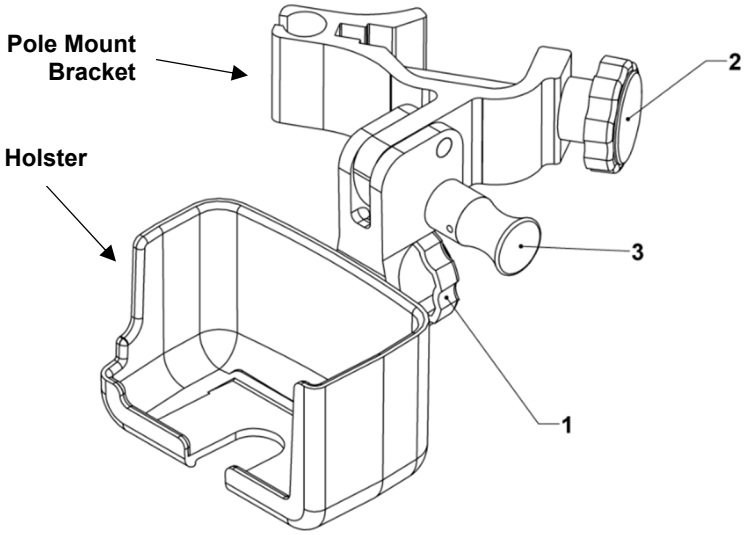



**Figure 13-1: Holster Assembly**

## Installing the Holster Assembly

1. Attach the holster to the pole mount bracket: Thread the pole mount bracket into the back of the holster by turning the black knob (Figure 13-1, 1) clockwise until the bracket is securely attached.
2. Attach the pole mount bracket to the IV pole: Turn the black knob (Figure 13-1, 2) clockwise until the bracket is securely attached to the IV pole.
3. Insert the pump into the holster.
4. (Optional) You can change the angle of the pump and holster. With one hand, hold the pump and holster. With the other hand, pull the black handled pin (Figure 13-1, 3) to release it. Move the holster with the pump to the desired angle. Then release the pin and adjust the angle up or down until the pin snaps back into position.
5. If necessary, the AC power cord and the PCA bolus cable can be connected to the pump while it is in the holster. To replace batteries, remove the pump from the holster first.

## Removing the Holster Assembly

1. If attached, remove the AC power cord and the PCA bolus cable from the pump.
2. Remove the pump from the holster.
3. Turn the black knob (Figure 13-1, 2) in the pole mount bracket counterclockwise to loosen the pole mount bracket.

4. Remove the pole mount bracket from IV pole.
5. Remove the holster from the pole mount bracket by turning the black knob (Figure 13-1, 1) counterclockwise.

## Li-Ion Battery Pack Charger

The Li-Ion battery pack charger is not for use in the patient environment. Refer to the instructions included with the battery pack charger for information on its use.

## Lockbox

The lockbox is a hard-plastic, durable case that is lockable with a combination. The 500 mL lockbox (part number 60201) will secure medication bags up to 500 mL, the administration set and the pump, and allows access to the pump's On/Off button, keypad, Bolus/Data and Power ports, and the battery compartment door.

All lockboxes can be pole-mounted with the detachable pole clamp, set on a stable flat surface, or carried in a soft carry pack.

## Attaching the Pole Clamp to the Lockbox

If the lockbox will be mounted on an IV pole, first attach the pole clamp to the lockbox.

1. Use Figure 13-2 for placement of the provided screws and washers and pole clamp orientation.
2. Using a screwdriver, secure the pole clamp to the lockbox as shown in Figure 13-2.

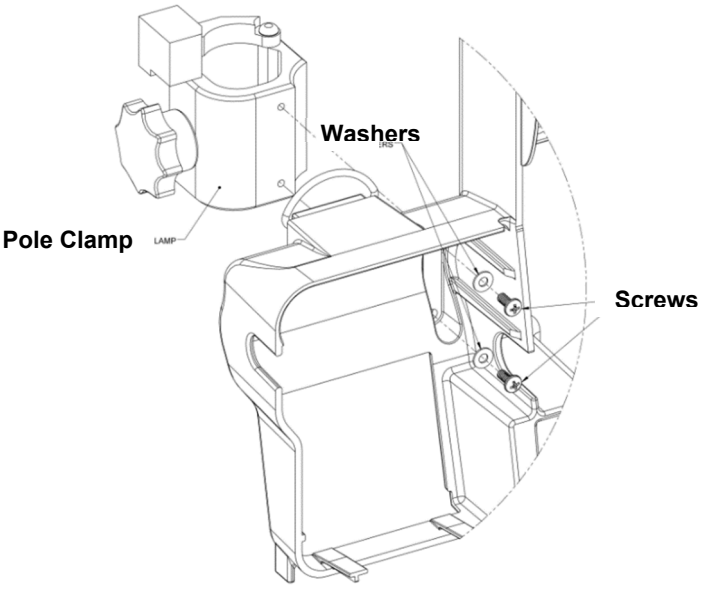



**Figure 13-2: Pole Clamp Placement on Lockbox**

## Installing the CURLIN 8000 into the Lockbox

If the lockbox will be mounted on an IV pole, first attach the pole clamp to the back of the lockbox. See previous section, “Attaching the Pole Clamp to the Lockbox”.

Before installing the pump into the lockbox, the administration set must be installed first. For more information, see Chapter 10, Administration Sets and Priming, p.85.

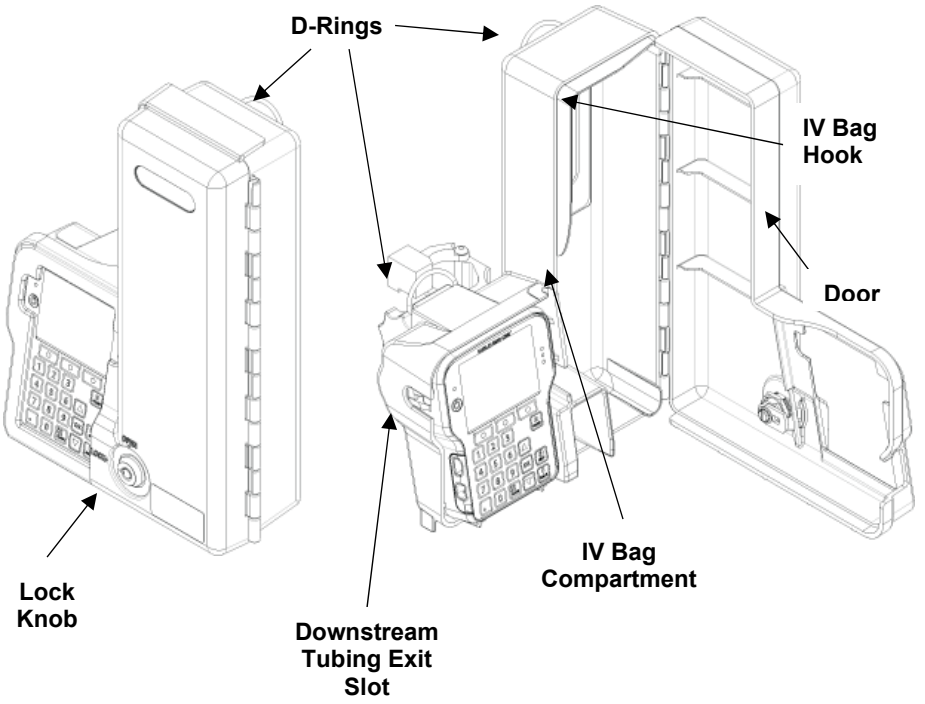



**Figure 13-3: Lockbox with CURLIN 8000 Installed**

1. Enter the correct combination on the lock knob. Contact your pharmacist if one was not provided.
2. Turn the lock knob to the OPEN position.
3. Swing the door open to the right.
4. With the administration set already loaded in the pump, insert pump into lockbox with the front of the pump facing you.
5. Insert the medication bag into the IV bag compartment. Hang the IV bag on the hook. Place the extra length of tubing in the bottom of the IV bag compartment. Ensure that the tubing is not crimped or pinched.
6. Ensure that the tubing between the pump and patient connection is exiting the lockbox through the downstream tubing exit slot.
7. Close the door, making sure the tubing is not pinched in the door.
8. Turn the lock knob to the LOCK position.
9. Secure the lockbox by inserting the key in the lock knob and turning key to the right.
10. Start the infusion when ready.

    The On/Off button and keypad are accessible while the pump is in the lockbox.

The AC power cord and PCA bolus handset can be connected and disconnected while the lockbox door is closed.

The battery compartment door can be accessed from the back of the lockbox.

11. The patient can use the attached strap to carry the lockbox (not pictured). Attach each strap hook to one of the two D-rings.

## PCA Bolus Handset

The PCA bolus handset connects to the left side of the pump. PCA therapy patients can use the button on this handset to request a bolus (Figure 13-4). The button on the PCA bolus handset works the same as the BOLUS button on the pump.

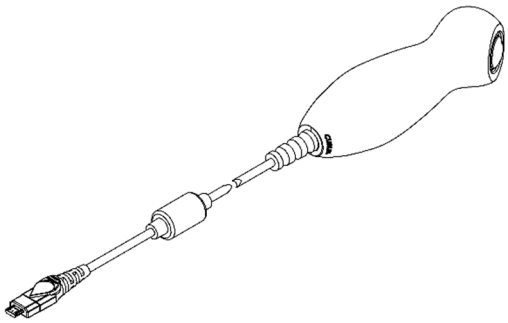


**Figure 13-4: PCA Bolus Handset and Cord**

**Caution** Do not connect to the Bolus/Data port with anything other than the provided PCA remote bolus handset or CURLIN 8000 data cable.

For instructions on how to test the functionality of the PCA bolus handset, see “Testing the PCA Bolus Handset”, p. 128.

**Warning** Only the patient may use the PCA bolus handset and BOLUS button on the CURLIN 8000. If anyone other than the patient initiates a PCA bolus, it may cause the patient to receive too much medication that could result in serious patient injury or death.

## Connecting/Disconnecting the PCA Bolus Handset

The PCA bolus handset can be inserted in only one direction in the access port. The drop of fluid symbol and the thumb rest indicate the front of the PCA handset connector.

**Note:** If the pump is secured in a lockbox, the Bolus/Data port is accessible from the left side of the lockbox.

1. Push the PCA bolus handset connector into the Bolus/Data port on the left side of the pump (Figure 2-3). An audio tone sounds.
2. After the infusion is completed, remove the PCA bolus handset from the pump by pulling the connector from the access port. If you disconnect the PCA bolus handset during a running PCA therapy, an audio tone sounds.

## Notes

# Chapter 14. User Assistance and References

## Customer Support Help

If you need to speak directly with a CURLIN 8000 support person, call 800.970.2337.

## CURLIN 8000 Help Button

Press the **HELP** button on the pump keypad to view screen-specific information. Press **BACK** to return to the previous screen.

## Troubleshooting

### Audio Characteristics

Audio tones are associated with any screen Alarm / Notification. These tones have a different number of notes to indicate the classification (urgency). See Table 14-1.

**Table 14-1: Description of Audio Alarm Tones**

| Type / Classification | Number of Notes | Repeated |
|---|---|---|
| High Priority Alarm | 10 notes | 10 seconds |
| Medium Priority Alarm | 3 notes | 15 seconds |
| Notification | 2 notes | N/A |
| Available PCA Press | 2 notes | N/A |
| Unavailable PCA Press | 1 note | N/A |
| Illegal Key Press | 1 note | N/A |

The volume of alarm tones will escalate while playing over a period of two minutes. At the end of two minutes, the alarm audio will be playing at maximum volume. At that time, the audio will switch over from the main speaker to the backup speaker and continue to emit the same number of notes until the user acknowledges (silences) the alarm.

If the alarm is silenced without correcting the alarm condition, the following occurs:

- The alarm sequence will repeat, starting at its original audio level and escalating over two minutes.
- The screen will display a “silenced” icon, in the place of the SILENCE soft key label during the two minutes. See Figure 14-1.

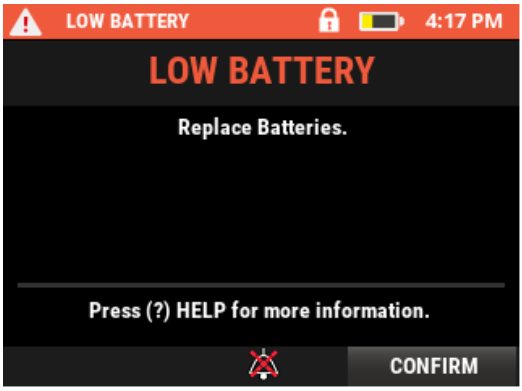



**Figure 14-1: Silenced Icon Example**

## Notifications

You may encounter messages displayed on the pump screen (Figure 14-2). Follow the instructions on the screen. Table 14-2 is an alphabetized list of notifications and explanations.


Notification screens have detailed help text associated with them. To view information about a specific notification message, press **HELP**.

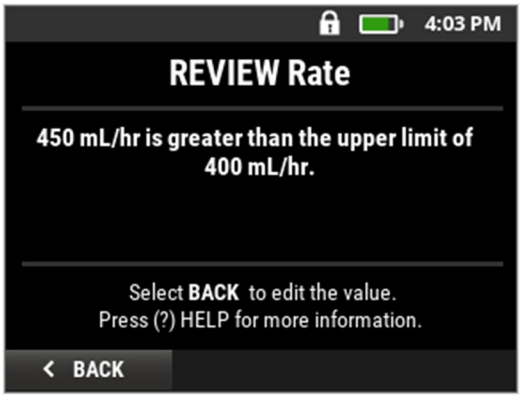



**Figure 14-2: Notification Screen Example**

**Table 14-2: Notification Definitions**

| Notification message on the screen: | When it is displayed: |
|---|---|
| ADJUSTING DOSE AMOUNT | During a paused Intermittent therapy, and the edited amount per dose is less than what has been delivered in the current dose. |

| Notification message on the screen: | When it is displayed: |
|---|---|
| ADJUSTING FINAL STEP | During a paused Variable therapy, the edited number of steps is decreased. The total volume will be maintained, adding the remaining amount of drug to the last step. |
| AMOUNT NOT AVAILABLE | When entering or editing a PCA therapy, the loading dose is greater than the bag volume. The programmed bag volume must be greater than the loading dose volume.<br>Or, during PCA therapy, when the requested clinician bolus would exceed the remaining bag volume. |
| BAG VOLUME IS ZERO | During priming, the programmed bag volume reached zero. |
| BOLUS EXCEEDS LIMIT | During PCA therapy, and when the clinician bolus is configured to count towards the hourly limit: the requested clinician bolus would exceed the Max Hourly Limit value set in the PSP. The Max Hourly Limit includes the accumulated Basal Rate, PCA boluses, and clinician boluses over the past 60 minutes. You can try to decrease the value of the clinician bolus to see if that value keeps under the Max Hourly Limit.<br>Or, when the requested PCA bolus would exceed the 1-hour limit amount. |
| BOLUS NOT GIVEN<br>PCA Bolus is currently locked out. | The lockout time has not expired, the maximum number of boluses per hours was reached, the hourly limit has already been reached, or the request would result in reaching the 1-hour limit amount. |
| CAUTION! AIR DETECTOR IS OFF | When the Air In Line sensor is set to OFF. This means that the pump will not alarm Air in Line until it has detected 3 mL of air in the administration set. Moog Medical recommends using an administration set with an air eliminating filter to reduce the potential of air delivered to the patient. The patient could be harmed if air remains in the administration set. |
| CHANGING DOSE AMOUNT | During a paused Intermittent therapy, the edited amount per dose is greater than what has been delivered in the current dose. When the infusion resumes, the current dose will continue and deliver the newly modified amount per dose. |
| CHECK BAG VOLUME | When the bag volume is insufficient to complete the entire infusion therapy after priming. You can start the infusion therapy, but the bag volume will reach zero before the prescribed amount is delivered to the patient. |

| Notification message on the screen: | When it is displayed: |
|---|---|
| CHECK DATE ENTRY | When the edited date is more than one day from the currently programmed date. You cannot change the date from the pump more than one calendar day from the current date on the pump. |
| CHECK DOSE DURATION | During Intermittent therapy programming after you enter the Dose Rate and Amount per Dose and the auto-calculated dose duration is longer than 24 hours or less than 1 minute. |
| CONFIRM ALARM | If you try to power the pump off while an alarm message is displayed. You must confirm the alarm before powering the pump off. |
| CURRENTLY RAMPING DOWN | During a TPN therapy, while the infusion is in Ramp Down mode, you cannot edit the Rx except for changing the infusion to Immediate Ramp Down. |
| DATE/TIME CHANGE | When the date or time is updated during a therapy. Changing the date or time does not affect dosing schedules, intervals, or lockouts. |
| DELETE CURRENT Rx? | From the Select Patient's Rx screen if you press NEW Rx and there is an existing Basic program already stored in the pump. If you press YES, the existing Basic program will be deleted (if a PSP is loaded, that will remain stored in the pump). If you press NO, the existing Basic program will be retained. |
| DISABLE AIR DETECTOR? | When the Air In Line sensor is set to OFF. The pump will not report air in the administration set line until it detects 3 mL of air. Moog Medical recommends using an administration set with an air eliminating filter to reduce the potential of air delivered to the patient. The patient could be harmed if air remains in the administration set. |
| DISCARD EDITS? | When entering a Basic program or editing an Rx (Basic or PSP), you press CANCEL. Any values added to a new program or changes to an existing program will not be saved. |
| DISCONNECT FROM PATIENT | When you press PRIME or select OPTIONS/Rx TASKS/PRIME. Never prime the administration set while it is connected to the patient. |
| EDIT NOT ALLOWED | During Intermittent therapy, after start of the first dose infusion, the number of doses cannot be edited. |
| HOURLY LIMIT REACHED | During PCA therapy if the hourly limit has been reached and a clinician bolus is requested. The clinician bolus will be available after the hourly limit has passed. |

| Notification message on the screen: | When it is displayed: |
|---|---|
| INFUSION IN PROGRESS | If you try to power the pump off while it is infusing. The infusion must be paused before you can power the pump off. |
| INSUFFICIENT VOLUME | While programming or editing a TPN therapy, the Ramp Up volume or Ramp Down volume is equal to or exceeds the programmed Volume To Be Infused (VTBI). |
| INVALID DATE ENTRY | When editing the date, you enter a year before 2016 or enter an invalid calendar date, such as February 30. The edited date can be one day from the displayed date. To make changes beyond one day, use the RxManager. |
| INVALID TIME ENTRY | When editing the time, you enter a time that is out of range for either 12-hour time (valid range: 00:00 – 12:59) or 24-hour time (valid range: 00:00 – 23:59). |
| KVO EXCEEDS LIMIT | If the entered KVO rate is greater than the infusion rate (Rate for Continuous therapy; Dose Rate for Intermittent therapy). The KVO rate must be less than the infusion rate. |
| KVO INTERRUPTED | During KVO and an alarm is confirmed (acknowledged). You can either end the KVO immediately (Completed home screen appears), or you can resume the KVO. |
| KVO RATE RESET | During Variable therapy, when you change the Variable rate to a Constant rate, the Constant rate cannot be lower than the KVO rate. The pump resets the KVO rate to the programmed Constant rate. |
| LAST Rx INCOMPLETE | When you select OPTIONS/REPEAT Current Rx or NEW Rx (PROGRAM) during a running infusion. |
| NEW PROGRAM NOT ALLOWED | If you try to program a new therapy and Basic programming is disabled. If the patient information or PSP loaded on the pump does not match the patient's prescription, power the pump off and return it to the health care provider. Obtain a new pump with the correct PSP. |
| NOTE OCCLUSION SETTING | For all therapies except TPN: When the rate is 2.5 mL/hr or less and the Occlusion Sensitivity is set to Low Sensitivity. |
| NOTE! NEW PATIENT SELECTED | When patient information is already programmed in the pump, and you select NEW PATIENT. If you press CONFIRM, all existing patient information, associated Basic and/or PSP programming, and patient reports will be deleted. |

| Notification message on the screen: | When it is displayed: |
|---|---|
| NOTE: CURRENT DOSE WILL END | During a paused Intermittent therapy if you edit the next dose start time. The current dose in progress will be cancelled. If you want to edit the next dose start time without ending the current dose in progress, edit it between doses. |
| OPTION NOT AVAILABLE | When you select a feature that is not available during the current infusion state. For example, when attempting to program a delayed start after the infusion has already started. |
| PM REMINDER | If the pump is due for its annual preventive maintenance (PM) checkup. You can continue using the pump, but it should be returned to the health care provider at the next convenient opportunity. This message will continue to appear each time the pump is powered on until after the PM service is performed. |
| POWER DOWN | When you press and hold the On/Off button for several seconds to power the pump off. A blank screen indicates that the pump is off. |
| PROGRAM SAVED | After you enter all program parameters within their limits. Also, this will be displayed after confirming a soft limit notification (**REVIEW <parameter name>**. This is confirmation that the program is successfully stored in the pump. |
| PUMP MUST BE PAUSED | While the pump is infusing, some options are unavailable. The infusion must be paused first. Examples: The Rx can be edited only while the infusion is paused. During an infusion, the pump must be paused before powering it down. |
| REPEAT Rx NOT ALLOWED | When you try to repeat an edited program that contains a combination of the original settings and edited settings. Whenever a program is repeated, some of the values of the original program are maintained on repeat (e.g., bag volume). Other settings carry over the edited value on repeat (e.g., dose). Sometimes, this combination causes an auto calculated value to be outside of the system limit. |
| REVIEW # OF STEPS | While editing a Variable therapy currently being infused, the edited number of steps is less than or equal to the number of steps already infused. This number must be equal to or greater than the steps already infused. |

| Notification message on the screen: | When it is displayed: |
|---|---|
| REVIEW <parameter name> | If the entered parameter value exceeds the upper soft limit value or is less than the lower soft limit value. The facility set the soft limits for the most common ranges for this therapy. Make sure that the value you are programming matches the physician's prescription.<br>If the entered parameter value exceeds the upper hard or upper system limit value or is less than the lower hard or lower system limit value. The facility set the hard limits for this therapy, and you may not exceed them. Press **BACK** and enter a valid value. If necessary, contact the facility for additional information. |
| REVIEW BAG VOLUME | If the entered bag volume is insufficient to complete the therapy as programmed. The entered bag volume should be the actual amount of fluid in the IV bag/reservoir and must be equal to or greater than the volume needed to deliver the therapy. Make sure that the programmed values match the physician's prescription. |
| REVIEW BASAL RATE | If the Basal Rate is greater than the Hourly Limit for a program that requires the Basal Rate to be less than or equal to the 1 Hour Limit. |
| REVIEW PROGRAM | When the calculated duration or rate is out of range.<br>While programming a TPN therapy, the entered Total Duration value is less than the Ramp Up value plus the Ramp Down value.<br>While programming or editing a therapy, the entered Dose Duration is greater than or equal to the Dose Frequency. |
| REVIEW RAMP DURATION | When programming an immediate ramp down during a TPN infusion, the duration is greater than the remaining or programmed ramp down duration. |
| SETTING SAVED | When you successfully change an option or parameter. This confirms that the update is saved to the pump. |
| TIME EXCEEDS LIMIT | When you enter the delayed start time of a Continuous, TPN, or Variable therapy to be in 0 minutes or over 23 hours and 55 minutes in the future. Make sure the delayed time is from 1 minute to 23 hours and 55 minutes from the current time. |

## Medium Priority Alarms

Medium priority alarms report conditions that require attention from the user but may not be safety issues. When they occur, a message displays on the screen and an audio alarm sounds.

| If it is: | Then the message displays: |
|---|---|
| an automatic medium priority alarm occurring while a therapy is infusing, such as PCA “Handset Unplugged”. | on the screen for 20 seconds. |
| a medium priority alarm that requires a user response, such as the first “Low Battery” occurrence | until the user presses one of the keys specified on the screen. |

While using the CURLIN 8000, you may encounter some common conditions, which will require you to interact with the pump. You should be able to resolve most pump conditions.

- When there is a medium priority alarm, the pump status bar will turn orange, a tone will sound, and the screen will provide information on the medium priority alarm condition.
- If present, press **SILENCE** to stop the audible alarm for two minutes. This does not clear the alarm screen.
- Follow the instructions on the screen to resolve the medium priority alarm condition. Press **HELP** to display detailed information about the medium priority alarm.
- Press **CONFIRM** to clear the medium priority alarm screen.
- If you do not respond to the medium priority alarm within two minutes, the audio tone volume increases.

Figure 14-3 shows examples of medium priority alarm screens and Table 14-3 contains an alphabetized list of medium priority alarms and resolutions.

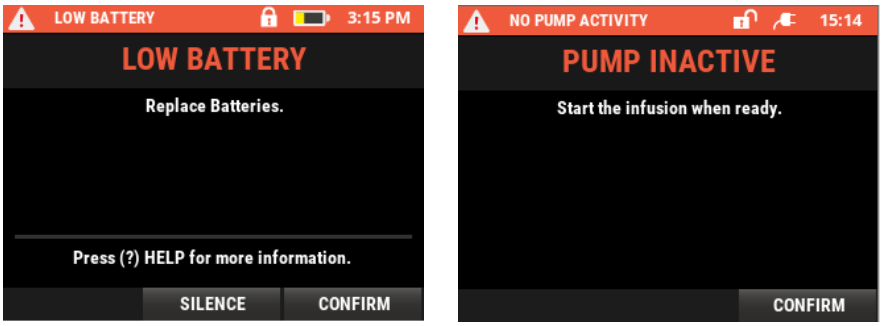



**Figure 14-3: Medium Priority Alarm Screen Examples**

If the information in the User Response column does not help you solve the problem, or if you have any questions, call the providing pharmacy or Moog Medical.

**Table 14-3: Medium Priority Alarm Definitions and Resolutions**

| Medium Priority Alarm Title and Message on Screen | Cause | User Response |
|---|---|---|
| BOLUS KEY STUCK<br>Disconnect bolus handset and reconnect. | Remote bolus button on bolus cord is stuck. | The PCA Bolus handset is not functioning. Disconnect it from the pump then reconnect. The BOLUS button on the keypad can be used instead of the bolus handset. Unplug the handset to use the BOLUS button. If the problem persists, contact your health care provider. |
| EDITS LOST<br>EDITS NOT SAVED<br>Program edits were made but not saved. Review program before running. | When there is no keypad activity for 2 minutes during edits.<br>Any edits are lost. | While entering or editing a program, changes made were not confirmed. The edits have been discarded. Review patient information and the full program prior to starting the infusion. Re-enter edits as necessary. |

| Medium Priority Alarm Title and Message on Screen | Cause | User Response |
|---|---|---|
| [This alarm is for PCA therapies only]<br><br>HANDSET UNPLUGGED<br>Use the PCA bolus button on keypad to request a PCA dose or reconnect the bolus cable. | In PCA therapy, the bolus cord was removed during a running or paused infusion. | For safety only the patient should press the PCA bolus button on the handset or the keypad.<br>If the bolus handset is plugged into the pump, the PCA button on the keypad will be disabled.<br>When pressing the PCA bolus button, two beeps indicate a bolus has been requested and is being delivered. One beep indicates a bolus has been requested but is not currently available and will not be delivered.<br>Refer to the Hourly Totals report to monitor the number of boluses attempted vs. given. |
| INFUSION SCHEDULED<br>START PUMP<br>Start infusion to maintain dosing schedule. | During Continuous, TPN, and Variable therapies, the pump was off or paused and the scheduled infusion has passed or is due to start within 5 minutes. | The pump must be running to deliver the dose as programmed.<br>If the scheduled time has passed, the dose will begin when the pump is placed in RUN mode. The delay start time can be changed in OPTIONS/Rx TASKS/DELAY START. |

| Medium Priority Alarm Title and Message on Screen | Cause | User Response |
|---|---|---|
| LOW BATTERY<br>Replace Batteries | The batteries are running low and should be replaced.<br><br>C Cells: Approximately 20% of the battery life is remaining. This represents a minimum of 30 minutes up to several hours.<br><br>Battery Pack: Approximately 30 minutes of battery life is remaining.<br><br>After the initial low battery alarm is confirmed, the yellow battery icon will be displayed. A self-dismissing low battery alert will sound every 10 minutes until the batteries are replaced, the AC Adapter is connected, or the battery is depleted.<br><br>See "EMPTY BATTERY" Alarm. | Press Confirm. If using C Cell batteries, pause the infusion, power off the pump and replace the batteries. Power up the pump and resume the infusion.<br><br>If using a rechargeable battery pack, plug the pump into AC power to recharge the battery pack. The battery pack can be charged in the pump while it is running. |
| MISSED DOSE START<br>DOSE IS LATE<br>Press CONFIRM and RUN to start the dose. | The pump was not running when the scheduled dose was due to start. | Press **RUN** to begin the next dose<br>If dose start time needs to be rescheduled, select OPTIONS/Rx TASKS/NEXT DOSE START. |
| [This alarm is for PSPs only]<br><br>NEAR END OF INFUSION<br>Rx ALMOST FINISHED<br>Prepare the next infusion if required. | The infusion is near the end. In Continuous, TPN, Variable and Intermittent therapy modes, the alarm will sound approximately 30 minutes prior to the end of the infusion. In the PCA therapy mode, the alarm will sound when approximately 10% of programmed bag volume remains. | Press **CONFIRM**. |

| Medium Priority Alarm Title and Message on Screen | Cause | User Response |
|---|---|---|
| NO BATTERY INSTALLED<br>INSERT BATTERIES<br>The pump is running on AC power. Insert batteries. | Battery compartment is empty. | When using AC power, it is recommended that working batteries are installed for backup power in the event the AC power is lost. To insert batteries: Slide the latch on the battery door to the unlocked position (right). Slide the battery door down towards the bottom of the pump. Insert two C Cell batteries or one CURLIN rechargeable battery pack. Replace the door and slide the latch in the locked position. |
| NO PUMP ACTIVITY<br>PUMP INACTIVE<br>Start the infusion when ready. | When the pump has been displaying a non-running screen for two minutes without any keys being pressed. Pump paused reminder. | Press **CONFIRM**, then press **RESUME** to continue the infusion when ready. |
| NO PUMP ACTIVITY<br>PUMP PAUSED<br>Start the infusion when ready. | When the pump has been displaying a Paused infusion screen for two minutes without any keys being pressed. Pump paused reminder. | Press **CONFIRM**, then press **RESUME** to continue the infusion when ready. |
| PUMP IS PAUSED<br>DOSE IS DUE SOON<br>The dose is scheduled to start in less than 5 minutes. Start pump to maintain schedule. | The pump was paused, and a dose is due to start in less than 5 minutes. | Press **RUN** to begin the next dose.<br>If dose start time needs to be rescheduled, select OPTIONS/Rx TASKS/NEXT DOSE START. |
| REPLACE BATTERY<br>Replace the rechargeable battery soon. | The Li-Ion batteries have exceeded their useful life. | The rechargeable battery has reached end of life. The battery can continue to be used but will require more frequent charging. Replace the batteries soon. |

| Medium Priority Alarm Title and Message on Screen | Cause | User Response |
|---|---|---|
| SETTINGS NOT APPLIED<br>EDITS NOT SAVED<br>An edit to the settings was not saved and has been discarded. Check settings before continuing. | When there is no keypad activity for 2 minutes during edits.<br>Any edits are lost. | While entering or editing a Clinical Setting or Device Setting in the OPTIONS menu (e.g., Lock Level, Air In Line, screen brightness), changes made to the settings were not confirmed. The unconfirmed edit has been discarded. Review the settings. Re-enter changes as necessary. |
| SPEAKER DAMAGED<br>The pump can be used until a new pump is obtained. | The regular speaker is not functioning. The backup speaker will be used instead. | The pump can be used until a replacement is obtained. Contact your health care provider as soon as possible. |
| STAND BY<br>The internal battery is recharging. This may take several minutes. Keep the pump powered up. | The pump's internal battery has become depleted due to non-usage for an extended period of time. Recharging to the minimum level is required. | Connect the pump to an external AC power source or install batteries. The pump must remain powered up to recharge the internal battery. The alarm clears when the internal battery is sufficiently charged. |
| TEMPERATURE ALERT<br>PUMP IS TOO HOT OR COLD<br>The pump may not deliver the correct amount at this temperature. | The pump has been in a location where the ambient temperature is outside normal operating range of 15-40 °C<br>The pump will continue to operate, but the delivery will be outside the +/- 5% accuracy specification. | When possible, move to an environment that is close to normal room temperature (20-22 °C)<br><br>Note, do not try to force a temperature change, e.g., hair dryer, refrigerator, etc. |

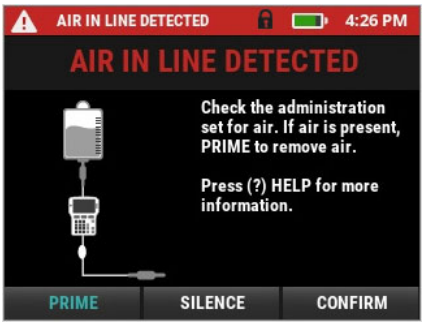
| Medium Priority Alarm Title and Message on Screen | Cause | User Response |
|---|---|---|
| UNUSABLE BATTERY<br>BATTERY NOT CHARGING<br>Replace with approved battery. | The rechargeable battery pack is not charging or is not working properly. | Remove the battery pack and replace with approved batteries.<br>You can connect the pump to an external AC power source until new batteries can be installed. Any edits being made to the program were discarded. |
| USB PORT DAMAGED<br>The pump can be used until a new pump is obtained. | The USB port is damaged. | The pump can be used until a replacement is obtained. The pump should be serviced as soon as possible. Contact your health care provider. |

## High Priority Alarms

High priority alarms are conditions that require the user to correct. They may be safety issues but are not system errors of the pump. All alarm conditions stop the infusion. The only exception is the **Infusion Complete** alarm, which allows the programmed KVO rate to continue infusing.

- When an alarm occurs, the pump status bar will turn red, the red infusion indicator light flashes, and the screen will provide information on the alarm condition.
- The pump alerts the user with an audible alarm.
- Press **SILENCE** to silence the alarm for two-minute intervals.
- Follow the instructions on the screen to resolve the alarm condition. Press **HELP** to display more detailed information. This also silences the alarm for two minutes.
- Press **CONFIRM** when you are finished with the alarm screen.
- Press **RESUME** to continue the current therapy.
- If you do not respond to the alarm within two minutes, the audible alarm volume increases.

Figure 14-4 shows examples of alarm screens and Table 14-4 contains an alphabetized list of high priority alarms and resolutions.





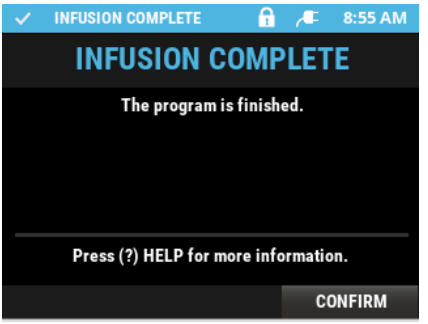



**Figure 14-4: High Priority Alarm Screen Examples**

If the information in the User Response column does not help you solve the problem, or if you have any questions, call the providing pharmacy or Moog Medical.

**Table 14-4: High Priority Alarm Definitions and Resolutions**

| High Priority Alarm Title and Message on Screen | Cause | User Response |
|---|---|---|
| [screen is blank; alarm sounds and red infusion indicator light flashes] | Most common cause is that power has been lost. | Press the Power button to clear the alarm.<br>Replace the batteries.<br>Press the Power button to turn pump on. |
| AC POWER CONNECTED<br>Replace batteries. Resume Infusion. | After the EMPTY BATTERY alarm is displayed and the pump is connected to an external AC power source, but the batteries currently installed do not have enough power to continue operating the pump. | The installed batteries did not have enough power to continue pump operation. The infusion is paused. Resume the infusion by pressing RESUME. Any edits made were discarded. |

| High Priority Alarm Title and Message on Screen | Cause | User Response |
|---|---|---|
| AIR IN LINE DETECTED<br>Check the administration set for air. If air is present, PRIME to remove air. | The pump detected air that exceeds the programmed air in line limit. | 1. Press **SILENCE**.<br>2. Disconnect the administration set from the patient.<br>3. Press **PRIME** (or go to OPTIONS/Rx TASKS/PRIME).<br>4. Press **CONFIRM** if set is detached from patient.<br>5. Press and hold **PRIME**. (Release **PRIME** and repress if more than 5 mL is required.)<br>6. Check administration set from pump to patient connector to ensure all air has been removed. **Note:** Even though fluid is coming out of the administration set, there could be air remaining between pump and patient connector.<br>7. Continue priming or Press **DONE**.<br>8. Re-connect the administration set to the patient.<br>9. Press **RESUME**.<br>**Note:** You can adjust the air in line limit from OPTIONS/CLINICAL SETTINGS. |
| AIR MAY BE PRESENT<br>CHECK IV BAG<br>The pump is not detecting fluid. Check bag and tubing. | The pump is not sensing fluid coming from the IV bag. The IV bag may be empty, or the tubing may be occluded. | If the bag is empty, hang a new bag or clamp the line and power off the pump. If air is present, prime as needed. Always disconnect the administration set from the patient before priming. |

| High Priority Alarm Title and Message on Screen | Cause | User Response |
|---|---|---|
| BACKUP BATTERY<br>FAILED TO CHARGE<br>The internal battery needs charging. Read HELP information. | After the backup battery depleted alarm, this displays when the external power supply connected to the pump fails to charge the backup battery.<br>The internal pump battery will no longer hold a charge. | Power the pump off then back on.<br>If this alarm repeats after 2-3 attempts the pump must be replaced.<br><br>Contact your health care provider for a replacement. |
| [This alarm is for non-PCA therapy modes]<br><br>BAG VOLUME IS ZERO<br>INFUSION ENDED<br>The infusion has reached zero before the end of infusion. | Due to priming, the bag volume has reached zero before delivering the entire program. | Press CONFIRM.<br>Press OPTIONS and either repeat this program (start a new IV bag), program a new Rx for this patient, enter a new program for a new patient, or access other features. |
| BATTERY ERROR<br>UNUSABLE BATTERY<br>Remove battery. Repower the pump with different batteries or AC power connected | Error with rechargeable battery pack. | The rechargeable battery pack must be replaced. Turn Off the pump, install C Cell batteries / new rechargeable battery pack or connect to an external AC power source. Turn On the pump and resume therapy. If problem persists, contact your health care provider. |
| CHECK TUBING<br>ADMINISTRATION SET ISSUE<br>The tubing in the pump is flattened. Press the Help button on the pump for troubleshooting tips. | The tubing is either blocked or worn out. | Removing and reinserting the tubing may resolve the issue. Ensure clamps are open and attempt to resume the infusion.<br>If alarm repeats, change the administration set, or contact your health care provider. |

| High Priority Alarm Title and Message on Screen | Cause | User Response |
|---|---|---|
| DOWN STREAM OCCLUSION<br>BLOCKAGE IN TUBING<br>Check for closed clamps or a kink in tubing. | There is a blockage in the tubing or in the patient's catheter. | 1. Unbend patient's arm or adjust patient's position if possible.<br>2. Follow tubing from pump down to patient's catheter insertion site.<br>3. Resolve any kinks in tubing.<br>4. Open the slide clamp if closed (pinching the tubing).<br>5. Resume the infusion if paused.<br>**Note:**<br>During the first minute of the alarm, the pump will detect reduced pressure in the set and automatically restart the infusion – a "two-tone" notification will sound. After the first minute the alarm will be "latched" and must be acknowledged. The infusion will need to be resumed. |
| EMPTY BATTERY<br>Install new batteries immediately. | The batteries no longer have sufficient power to run the pump.<br>The infusion stopped. | The battery power is too low to run the pump. Change the C Cell batteries / rechargeable battery pack or connect to an external AC power source.<br>Note: If batteries are not installed or external AC power is not connected, the pump will power off 2-1/2 minutes after the alarm appears on the screen.<br>It is recommended that new C Cell batteries or the rechargeable battery pack be installed even when connected to AC power. |

| High Priority Alarm Title and Message on Screen | Cause | User Response |
|---|---|---|
| FAULTY AC ADAPTER<br>Change power source. | The AC adapter plugged into the pump is not working correctly or has an incorrect voltage. | Remove the faulty AC adapter immediately and replace with an alternate power source (C cell batteries, rechargeable battery pack, another AC adapter). Any edits made were discarded. |
| [This alarm is for non-PCA therapy modes]<br><br>INFUSION COMPLETE<br>The program is finished. | The infusion is complete. | The programmed infusion is complete. The infusion may be repeated from the home screen. Press CONFIRM to return to the home screen.<br>If a KVO (keep vein open) rate has been programmed, the pump will continue to deliver at that rate until the pump is paused. |
| [This alarm is for PCA therapy mode only]<br><br>INFUSION COMPLETE<br>BAG EMPTY<br>The program is finished. | The bag is empty, and infusion ended. | The programmed infusion bag is empty. The infusion may be repeated from the home screen (start a new IV bag). Press CONFIRM to return to the home screen. |
| [This alarm is for non-PCA therapy modes]<br><br>INFUSION IS COMPLETE<br>BAG EMPTY<br>The infusion has finished, and the bag volume has reached zero. | The infusion is complete, and the bag is empty. | The programmed infusion bag is empty. The infusion may be repeated from the home screen (start a new IV bag). Press CONFIRM to return to the home screen. |

| High Priority Alarm Title and Message on Screen | Cause | User Response |
|---|---|---|
| MOTOR STOPPED<br>OPEN THE DOOR<br>The pumps motor has stopped. To resolve alarm, open and close the door. | The motor stopped during an active infusion. | Open and then close the door, press “Resume” to continue the infusion.<br>If unable to resolve the alarm condition, contact your health care provider.<br><br>Please note if installed in a Lockbox, the pump must be removed from the Lockbox prior to opening/closing the door to resolve the alarm. |
| STUCK KEY<br>Release key or remove power. | A key was pressed too long or is stuck. Infusion is paused. | Release key.<br>If unable to resolve the alarm condition, contact your health care provider. |
| STUCK KEY RESOLVED<br>Infusion is not running. Start infusion. | When stuck key is released. | A button on the keypad was stuck and has since been resolved. Press CONFIRM. Press RESUME to continue infusion. If the problem persists, contact your health care provider. |
| TEMPERATURE TOO HIGH<br>PUMP IS TOO HOT<br>The pump is too hot to operate properly. Power off the pump and let it cool down. | The pump has been in a location where the ambient temperature is greater than 45 °C.<br>The pump cannot operate at this temperature. | Move to an environment that is close to normal room temperature (20-22 °C) and allow the pump to cool down before resuming operation.<br>If the problem persists, contact your health care provider. |

| High Priority Alarm Title and Message on Screen | Cause | User Response |
|---|---|---|
| THE DOOR IS OPEN<br>CLOSE THE DOOR<br>Ensure the tubing is properly installed. Close and latch the door. | The pump door is not completely latched closed during:<br>- any type of infusion delivery<br>- a program with delay start or next dose start<br>- priming | Always pause the pump before opening the door. The door must be closed and latched before the pump will run. If the door does not easily close, remove, and reinsert the tubing. If the door still does not close easily, contact your health care provider. |
| TUBING NOT INSERTED<br>INSERT TUBING<br>1. Open door fully<br>2. Insert blue pin<br>3. Insert flow stop<br>4. Close door<br>5. Latch door<br>6. Done | When administration set is not properly installed during any type of infusion delivery or programmed with delay or next dose start, or during priming. | Check to ensure the blue tubing guide and the flow stop are inserted appropriately. The blue pin must be inserted into the tubing guide receptacle above the door hinge (indicated by the blue arrow). The yellow flow-stop must be placed in the flow-stop receptacle (indicated by the yellow arrow). See Figure 10-5. Use only approved CURLIN administration sets. |
| UP STREAM OCCLUSION<br>BLOCKAGE IN TUBING<br>1. Remove obstruction between pump and IV bag.<br>2. Open and close the door to dismiss the alarm. | An occlusion was detected between the IV bag and pump. The pump is now paused. | Check to ensure there is fluid in the bag and that there is nothing blocking the fluid path.<br>The door must be opened and then closed to resume the infusion.<br>If using a vial as the medication container, confirm that a vented spike set is being used. |

## Malfunctions

If the pump encounters an error, a numeric code will appear on the screen (Figure 14-5). See Table 14-5 for the list of possible malfunctions.

**Caution** To prevent malfunctions, press the On/Off button to power off the pump. Do not remove the power source before powering off the pump.


**Figure 14-5: Error Code Screen Example**

If a malfunction screen appears, power the pump off and back on.

- **If the malfunction does not reoccur**, and the pump passes its start-up diagnostic tests (both startup splash screens appear and the three infusion status indicator lights flash on and off), resume the therapy and continue using the pump. Always review the infusion program after a malfunction to ensure that the settings are correct before resuming the infusion.
- **If the malfunction reoccurs**, record the error code number. Power the pump off and return it to the health care provider. Report the error code number to the health care provider. Replace the faulty pump with a different one.

**Table 14-5: Malfunction Error Code Definitions**

| Malfunction Error Code | Cause |
|---|---|
| 1 | Software failure |
| 2 | Software update required |
| 3 | Software update required |
| 15 | Update pump configuration by connecting pump to the RxManager Enterprise Solution Software |
| 16 | Error was detected in any of the files associated with the current patient |
| 52 | Red indicator light failure |

| Malfunction Error Code | Cause |
|---|---|
| 101 | Green indicator light failure |
| 151 | Yellow indicator light failure |
| 201 | Screen failure |
| 251 | Piezo failure |
| 252 | Main audio failure |
| 301 | Keypad failure |
| 452 | Hardware failure |
| 501 | Software update required |
| 505 | Flash failure |
| 601 | Health check failure |
| 602 | System cross check failure |
| 702 | Software failure |
| 706 | System cross check failure |
| 707 | Watchdog failure |
| 1000 | Software failure |
| 1101-1201 | Hardware failure |
| 1202 | Software update required |
| 1251-1302 | Software failure |
| 1303-1354 | Hardware failure |
| 1401 | Software update required |
| 1402 | Error was detected in any of the files associated with the current patient |
| 1450-1454 | Hardware failure |
| 1501 | Backup battery failure |
| 1551 | Hardware failure |
| 1601 | Hardware failure |
| 1602 | Software failure |
| 1603 | Error was detected in any of the files associated with the current patient |
| 1701 | Hardware failure |

## Terminology and Definitions

This glossary contains terms that you will see when using the pump and the RxManager. Although you may be familiar with most terms, CURLIN 8000 and RxManager-specific definitions are included here.

| | |
|---|---|
| # of Steps | See “Variable Therapy Program Settings”, p. 77. |
| 1 Hour Limit | See “PCA Therapy Program Settings”, p. 51. |

| | |
|---|---|
| Advisory | Clinical information or reminder for the pump user, which will be displayed on the CURLIN 8000 screen after a PSP is selected to run. |
| Air In Line Sensitivity | Refer to “Setting Air in Line Sensitivity” p. 122. |
| Amount Per Dose | Refer to “Intermittent Therapy Program Settings”, p. 69. |
| Amt TBI/AMT TBI | See “Continuous Therapy Program Settings”, p. 45. |
| ASV | Anti-Siphon Valve |
| Bag Volume/BAG VOL | Refer to the specific therapy Program Settings section. |
| Basal Rate | See “PCA Therapy Program Settings”, p. 51. |
| Basic Program | A clinician enters patient and prescription information into the pump using the keypad. A Basic Program has no dose error prevention safeguards. This is one of two methods of programming the pump. See also PSP. |
| Basic Rx Enabled/Disabled | A PSP setting programmed by the pharmacist which cannot be changed on the pump. Enabled means that a clinician can enter a Basic Program in addition to the PSP. Disabled disallows a clinician from entering a Basic Program on the pump. |
| Clinician Bolus | A single bolus administered by the clinician in PCA therapy. The bolus is generally given by prescriber’s order during a pain crisis to bring the pain down to a manageable level. |
| Concentration | The amount of the drug in milligrams or micrograms per milliliter of solution. This is displayed on the pump home screen in the Header below the words “Basic Infusion” or the name of the drug. |
| Delivery Limit Mode | See “PCA Therapy Program Settings”, p. 51. |
| DERS | Dose Error Reduction Software |
| DOB | Date Of Birth. The Patient’s DOB is displayed on the pump screen when enabled in the configuration. |
| Dose | The quantity or amount of medication taken at one time. |
| Dose Duration | See “Intermittent Therapy Program Settings”, p. 69. |
| Dose Frequency | See “Intermittent Therapy Program Settings”, p. 69. |
| Dose Rate | Refer to the specific therapy Program Settings section. |
| Duration | This is the length of time in hours: minutes. |

| | |
|---|---|
| Edit Next Dose Start Time Permission | (For Intermittent therapy mode) when enabled, allows user to alter the start time of the next dose without entering an access code regardless of the lock level setting. |
| End of Infusion Escalation (EOIE) | When enabled, the alarm volume at the end of infusion will increase to the maximum level until the user presses the CONFIRM button on the pump's keypad. End of infusion is when the amount to be infused has been delivered or when bag volume reaches zero (PCA mode). |
| EPI/Epidural | Administration upon or over the dura mater within the spinal canal. |
| ES | Enterprise System |
| Hard Limit | These are the maximum and minimum values allowed for a program setting within a PSP. There may be Upper Hard Limits (UHL) and Lower Hard Limits (LHL) that cannot be overridden. |
| HH:MM | Hours and Minutes (to set time entry 24 hour or 12-hour AM/PM). |
| hr | Hour |
| IA/Intra-Arterial | Administration within an artery or arteries. |
| INF/Infusion | Fluid or medication pumped into an access site via various routes of delivery. Used interchangeably with Program or Rx. |
| INT | Intermittent |
| IV/Intravenous | Administration within or into a vein or veins. |
| KVO | Keep Vein Open. The delivery of small amounts of infusate (fluid or medication) for the purpose of maintaining patency of the access site. Refer to the specific therapy Program Settings section for more information. |
| LHL | Lower Hard Limit. See also Hard Limit. |
| Loading Dose | See "PCA Therapy Program Settings", p. 51. |
| Lock Level | This level (OFF, 1, 2, 3) determines which features require an Access Code to be entered at the pump. See Table 12-1: Lock Level Definitions, p 119. |
| Lockout Time | See "PCA Therapy Program Settings", p. 51. |
| LSL | Lower Soft Limit. See also Soft Limit. |
| Max # of Boluses per Hour | See "PCA Therapy Program Settings", p. 51. |
| mcg | Microgram. A unit of measurement equal to one millionth of a gram. |
| mcg/hr | Micrograms per hour |
| mcg/mL | Micrograms per milliliter. Used to define the concentration of the solution. |

| | |
|---|---|
| mg | Milligram. A unit of measurement equal to one thousandth of a gram. |
| mg/hr | Milligrams per hour |
| mg/mL | Milligrams per milliliter. Used to define the concentration of the solution. |
| Min, m | Minute |
| mL | Milliliter. A unit of measurement equal to one one-thousandth of a liter or one cubic centimeter. |
| mL/hr | Milliliters per hour |
| MRI | Magnetic Resonance Imaging |
| NA | Not Applicable. It is used to indicate when information in a certain field is not provided because it does not apply. |
| Near End of Infusion Alarm (NEOI) | When enabled, the pump will notify the user with an audio tone and alarm message when:<br><br>(For all therapies except PCA) The infusion is running and there are 30 minutes of time remaining before Infusion Complete.<br><br>(For PCA therapy) There is less than 10% bag volume remaining. The user must confirm the alarm using the pump's keypad. |
| Number of Doses per Bag | See "Intermittent Therapy Program Settings", p. 69. |
| Occlusion | A blockage in the administration set or patient's catheter, which prevents the delivery of medication to the patient. See "Setting the Occlusion Sensitivity", p. 121. |
| Patient ID | When creating a PSP or a Basic Program, the pharmacist or clinician can enter a unique number to identify the patient. |
| Patient Prime Permission | (For all therapies except PCA) When enabled, regardless of the Lock Level setting, the Access Code does not need to be entered in order to prime the administration set using the pump. |
| PCA | Patient Controlled Analgesia. A type of therapy where pain is controlled by various methods such as a continuous rate of infusion, patient-controlled boluses, and clinician boluses. Also, a specific therapy mode in the pump. See Chapter 6, p. 51. |
| PCA Bolus | See "PCA Therapy Program Settings", p. 51. |
| Perineural | Administration surrounding a nerve or nerves. |
| Plateau Rate | See "TPN Therapy Program Settings", p. 61. |
| Protocol | A defined set of parameters for a course of medication therapy. |

| | |
|---|---|
| PSP | Patient Specific Protocol. A defined set of parameters for a course of medication therapy created with a specific patient in mind. A pharmacist uses the RxManager to create the PSP. It is transferred from the RxManager to the pump and is immediately ready for a nurse or patient's caregiver to initiate. This is one of two methods of programming the pump. See also Basic Programming. |
| Ramp Down | See "TPN Therapy Program Settings", p. 61. |
| Ramp Up | See "TPN Therapy Program Settings", p. 61. |
| Rate | See "Continuous Therapy Program Settings", p. 45. |
| Remaining Bag Volume | The amount of the programmed bag volume that has not been delivered. |
| Repeat Rx | Repeat the present therapy from the beginning. For example, this is used when hanging a new IV bag or reservoir with the same prescription. |
| Resume | To restart the infusion after a pause or interruption. The infusion continues from where it left off. |
| Route | (For PCA therapy) The fluid delivery method (see also EPI, IV, or SQ). |
| Rx | Prescription. Written order for medication with instructions of how to administer as time, dose, amount, limits, and route. The written order is turned into an infusion program, which is entered into the pump. |
| Rx # | Prescription number: a unique identifier that correlates to a specific patient, specific drug-related information, and other information related to a prescription. This number is automatically generated by the pharmacy each time a new prescription is ordered and may be displayed on the pump when a PSP is programmed. |
| RxManager | Software used to program patient-specific therapies for the pump. |
| Soft Limit | Parameters within a protocol, which the clinician who is creating a Basic Program at the pump can override in the case of unique patient circumstances. These are suggested not-to-exceed limits that the health care facility sets. |
| SQ/Subcutaneous | Administration beneath the skin. |
| Step Amt TBI | See "Variable Therapy Program Settings", p. 77. |
| Step Duration | See "Variable Therapy Program Settings", p. 77. |
| Step Rate | See "Variable Therapy Program Settings", p. 77. |
| Template | Non-patient specific protocol that contains the drug/fluid, concentration, therapy type, and any advisories. |

| | |
|---|---|
| TBI | To be Infused. The volume (Vol TBI) or amount (Amt TBI) that will be given to the patient. |
| Total Dose | Refer to the specific therapy Program Settings section. |
| Total Duration | Refer to the specific therapy Program Settings section. |
| Total Volume | Refer to the specific therapy Program Settings section. |
| TPN | Total Parental Nutrition. A method of feeding that bypasses the gastrointestinal tract. Fluids are given into a vein to provide most of the nutrients the body needs. Also, a specific therapy mode in the pump. |
| UHL | Upper Hard Limit. See also Hard Limit. |
| USB | Universal Serial Bus |
| USL | Upper Soft Limit. See also Soft Limit. |
| Variable Therapy | A type of therapy where 1 to 24 individual programs or doses are delivered. Also, a specific therapy mode in the pump. |
| VOL | Volume. Amount of fluid. |
| Vol TBI/VTBI | Volume To be Infused.<br>See “TPN Therapy Program Settings”, p. 61. |

# Chapter 15. Cleaning and Maintenance

## Cleaning the Pump and Accessories

**Caution** The CURLIN 8000 is partially fluid-resistant and can withstand fluid spillage within limits. However, the CURLIN 8000 will not withstand total submersion. Moisture buildup within the case could cause damage to the operating components.

Use only approved cleaners and cleaning methods. Using unapproved cleaners or cleaning methods can damage the pump.

The medical device manufacturer validated the provided cleaning instructions as being CAPABLE of preparing a medical device for re-use. It remains the responsibility of the processor to ensure that the reprocessing is actually performed using equipment, materials, and personnel in the reprocessing facility to achieve the desired result. This normally requires validation and routine monitoring of the process.

### Point of Use Care

During and immediately following use of the Curlin 8000, inspect the pump for any visible spills, soils, or contaminants. To avoid build up and/or drying of foreign material on the pump, immediately remove the material following the Manual Pump Cleaning procedure and Cleaning Agents shown below.

### Approved Cleaning Agents

- Warm soapy water (do not submerse)
- Quaternary Ammonium Compound (Super Sani-Cloth® Germicidal Disposable Wipes)

### Manual Pump Cleaning

The CURLIN 8000 is resistant to fluid spillage from any direction. Keep the pump surfaces clean, dry, and free of fluid spillage at all times.

- Do not immerse the pump in any fluid.
- Do not use the pump in the shower, sauna, or steam bath.
- Do not position the pump where it could accidentally be dropped into a container of fluid (e.g., basin, tub, or toilet).

1. Thoroughly clean the CURLIN 8000 pump, using a commercial wipe (or applying any of the approved cleaning agents to a soft, clean cloth). Gently wipe the pump for a minimum of one (1) minute or until visually clean.

- Do not spray any cleaning agents directly on the CURLIN 8000.
- Do not soak the pump with cleaning agents.
- Do not use sharp or abrasive objects.
- Replace soiled wipes as needed, changing wipes when necessary to ensure that all surfaces are uniformly cleaned.

2. Using the wipes/cloth from previous step, open the pump door to expose the pumping surfaces. Gently wipe the inside surfaces of the pumping mechanism for a minimum of 30 seconds. Replace soiled wipes as needed, changing wipes when necessary to ensure that all surfaces are uniformly and thoroughly cleaned.
3. Dry the device using a clean, soft non-linting wipe.
4. Visually inspect the device in a well-lit area to ensure all surfaces are clean. If soil or contaminants are still present, repeat the above procedure until the pump is thoroughly clean.

### Disinfection

1. Use Super Sani-Cloth Germicidal Disposable Wipes to disinfect the pump.
2. Thoroughly wipe external surfaces of the front, sides and back of the pump. Open the pump door to expose the pump surfaces and gently wipe the inside surfaces of the pumping mechanism. Allow all surfaces to remain visibly wet for a minimum of two minutes. If needed, use additional wipes to ensure the surfaces remain wet for the full duration. Thoroughly wipe crevices and hard-to-disinfect areas.
3. After the two-minute contact time for the front surfaces of the pump, allow to thoroughly air dry (minimum of four minutes).

If the CURLIN 8000 is exposed to fluids, power off the device. Remove the battery door and remove the batteries. Remove fluid from the pump and batteries using a clean, soft cloth. Reinstall the batteries and battery door and resume operation.

## Cleaning the Carrying Pack

The optional soft carrying packs are intended for single patient use.

To clean small carrying packs follow the manufacturer's instructions. For detailed cleaning instructions go to www.triacmed.com/bag_care/.

## Transport and Storage

Before transporting or storage: remove the batteries from the pump, clean the pump, and keep the pump in its original packing container.
See Chapter 17, Technical Specifications, pg. 176, for the temperature and relative humidity storage range conditions. Storage outside the recommended storage conditions may reduce battery life.

Store all accessories in their original packing containers to ensure the longest service.

## Device Verification

Device calibration may be confirmed by the biomedical engineer / technician using the CURLIN Service Manager software's pump verification feature. Refer to the CURLIN Service Manager User Manual for instructions.

## Maintenance

Yearly preventive maintenance checks are recommended and will be prompted in the Setup Menu and on the display when the date occurs. This date accrues from the date of factory release and is reset when each annual maintenance check is completed. Pump maintenance / calibration to be performed by Moog Service.

Any time an error code message occurs repeatedly or any time a pump appears to be tampered with or shows any indication of not performing to standards, return the pump to the health care provider who dispensed the pump.

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**Warning** Do not open or modify the CURLIN 8000. Unauthorized opening or modification may result in pump malfunction and serious patient harm.

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No unauthorized personnel should attempt to open the hard case of the pump.

## Limited Warranty

ZEVEX, Inc. (the manufacturer) warrants to the original purchaser that the CURLIN 8000 infusion pump (the pump), not including accessories, shall be free from defects in material and workmanship under normal use, if used in accordance with this User's Manual, for a period of one year from the actual date of sale to the original purchaser.

The warranty does not cover normal wear and tear and maintenance items, and specifically excludes batteries, administration sets, extension sets, or any other accessory items or equipment used with the pump.

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 one-year period.

The following conditions, procedures, and limitations apply to the manufacturer's obligation under this warranty:

1. 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, medical personnel, or a medical facility that purchases the pump for treatment of patients. The original purchaser should retain the invoice or sales receipt as proof as to the actual date of purchase.
2. WARRANTY PERFORMANCE PROCEDURE: Notice of the claimed defect must be made in writing or by telephone to the manufacturer as follows:

Customer Service Department, ZEVEX, Inc., 4314 ZEVEX Park Lane, Salt Lake City, UT 84123, (801) 264-1001. Notice to the Manufacturer must include 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 and confirmed with issuance of an RMA (Return Materials Authorization) number. When 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.

3. 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 not limited to, use not in compliance with the User'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.

4. LIMITATIONS AND EXCLUSIONS: Repair or replacement of the pump or any component part thereof is the EXCLUSIVE remedy offered by the manufacturer. The following and limitations shall apply:

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

    b. THERE IS NO WARRANTY OF MERCHANTABILITY OR FITNESS OR USE OF THE PUMP FOR ANY PARTICULAR PURPOSE.

    c. The pump can only be used under the supervision of medical personnel whose skill and judgment determine the suitability of the pump for any particular medical treatment.

    d. 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.

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. The manufacturer shall not be responsible for any incidental damages 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, which may vary from state to state.

# Chapter 16. Default Configuration

The following list contains the factory settings for the CURLIN 8000 parameters.

| Parameter | Description | Default Setting |
|---|---|---|
| Config Name | Device specific information (Viewable on the Device info screen). | Factory Configuration |
| Config Version | | 1 |
| Customer Site ID | | 1 |
| CONT mL units enabled | Therapy modes and units available for basic programming. | Enabled |
| CONT mg units enabled | | Enabled |
| CONT mcg units enabled | | Enabled |
| PCA mL units enabled | | Enabled |
| PCA mg units enabled | | Enabled |
| PCA mcg units enabled | | Enabled |
| VAR mL units enabled | | Enabled |
| VAR mg units enabled | | Enabled |
| VAR mcg units enabled | | Enabled |
| INT mL units enabled | | Enabled |
| INT mg units enabled | | Enabled |
| INT mcg units enabled | | Enabled |
| TPN mL units enabled | | Enabled |
| Continuous Rate or Dose Rate Hard Limit (mL/hr equivalent) | Description Ch. 3 | 500 mL/hr |
| TPN Plateau Rate Hard Limit | Description Ch. 3 | 500 mL/hr |
| Intermittent Dose Rate Hard Limit (mL/hr equivalent) | Description Ch. 3 | 500 mL/hr |
| Variable Step Rate Hard Limit (mL/hr equivalent) | Description Ch. 9 | 500 mL/hr |
| Country | Country pump is assigned to | USA |
| Language | Language displayed on the pump | English |
| Time Format (12 or 24 hr) | Displays time with AM/PM. | 12 hours (AM/PM) |

| Parameter | Description | Default Setting |
|---|---|---|
| Lock Level | Determines which features can be accessed on the pump without entering the access code. (see Table 12-1: Lock Level Definitions, p. 119) | 2 |
| Access Code | Five-digit code that pump user must enter to access secured features. | Intentionally left blank to maintain security. Healthcare providers may contact Moog Medical to obtain the default access code. |
| Health Care Provider Support Phone # | Optional display of HC provider's phone number on Help Screens | Blank |
| Air In Line Sensitivity | See Ch. 12 Setting the Air In Line Sensitivity; Definitions, Ch. 4 | 0.5 mL |
| Occlusion Sensitivity (downstream pressure) | See Ch. 12 Setting the Occlusion Sensitivity; Definitions, Ch. 4 | MEDIUM (400 mmHg) |
| Display Date of Birth on Pump | Patient information viewable on the Verify Patient and Rx Details screens. | Disabled |
| Display Patient ID on Pump | | Disabled |
| Display Rx# on Pump | | Disabled |
| End of Infusion Alarm-Escalation | At the end of the infusion, the alarm will increase in volume until confirmed. | Enabled |

# Chapter 17. Technical Specifications

## Tested Drugs by Route

Tested drugs by route:

| Route of Administration | Drug Product | Target Concentration |
|---|---|---|
| Intravenous | Morphine Sulfate Inj. | 0.5mg/mL |
| Epidural | Ropivacaine HCl | 0.2% |
| Intra-arterial | Floxuridine | 0.5 mg/mL |

## Routes by Environment of Care

**Caution** The CURLIN 8000 is indicated for multiple delivery routes. However, not all routes are applicable or appropriate for all settings. Selection of appropriate routes of delivery for home use is important. Some routes require full time clinical management and monitoring and are not appropriate for the home setting (see Table 17-1). The colored cells indicate which routes are appropriate for the care environment.

Carefully consider the expected patient/caregiver interactions with the pump when a clinician is not present.

Drugs and solutions must only be delivered into routes indicated for per the drug/solution labeling.

**Table 17-1: Appropriate Routes of Delivery by Environment of Care**

| Supported Routes | Clinical Setting / Clinician Present | Home Setting / Clinician Not Present |
|---|---|---|
| Intravenous | ✓ | ✓ |
| Perineural | ✓ | ✓ |
| Subcutaneous | ✓ | ✓ |
| Epidural | ✓ | ✓ |
| Intra-Arterial | ✓ | Not appropriate |

## Delivery Specifications

| Common Delivery Specifications | |
|---|---|
| Bag Volume | 1 to 9999 mL<br>Programmable in 0.1 mL increments up to 99.9 mL; Programmable in 1 mL increments from 100 mL to 9999 mL<br>Displayed in 0.1 mL increments |
| KVO | 0.1 mL/hr – 9.9 mL/hr in increments of 0.1 mL/hr |
| Volume Delivered | 0 to 9999 mL<br>Displayed in 0.1 mL increments |
| Delayed Start | 1 min to 23:55 hr: min<br>1 min increments |
| Air In Line Sensitivity | OFF (3 mL) the pump will alarm if 3 mL of air is detected<br>0.1 mL (±0.05 mL)<br>0.5 mL (±0.1mL)<br>1 mL (±0.2 mL)<br>2 mL (±0.4 mL) |
| Alarm Volume | 1 to 10 (10 being the highest)<br>Switches to Piezo after 2 minutes of alarm escalation |
| PM (Preventive Maintenance) Reminder | During power ON, when:<br>- Current Date on pump is beyond the Maintenance Date<br>- Low RTC battery<br>- Malfunction in the previous power cycle that requires to display this message<br>- Primary Speaker Failure alarm in the previous power cycle |
| Custom Keypad Code | 5-digit numeric code (00000 to 99999, as per configuration/PSP) |
| Date Format | MMM DD YYYY<br>(DD MMM for Hourly Totals (as applicable)) |
| Time Format | - 00:00 to 23:59 military<br>- 12-hour AM/PM |
| Down Occlusion Sensitivity | - LOW Sensitivity (900 mmHg +- 250 mmHg)<br>- MEDIUM Sensitivity (400 mmHg +- 150 mmHg)<br>- HIGH Sensitivity (250 mmHg +-150 mmHg)<br>*Note: Temperatures above room temperature (22°C) may increase occlusion sensitivity resulting in early occlusion alarms.* |
| Upstream Occlusion Sensor | On |

| Continuous Therapy Delivery Specifications | |
|---|---|
| Amount TBI | 0.1 mL – 99.9 mL in increments of 0.1<br>100 mL – 9999 mL in increments of 1 mL |
| Rate | 0.1 mL/hr – 99.9 mL/hr in increments of 0.1 mL<br>100 mL/hr – 500 mL/h in increments of 1 mL |
| Duration | 1 min – 288:00 hr: min in increments of 1 min |

| PCA Delivery Specifications | |
|---|---|
| Dosing Units | Milliliters (mL)<br>Milligrams (mg)<br>Micrograms (mcg) |
| Concentration | Basic Infusion:<br>mg/mL –<br>0.1 - 50 mg/mL: in increments of 0.1 mg/mL<br>mcg/mL –<br>0.1 to 50 mcg/mL in the increments of 0.1 mcg/mL<br><br>PSP Infusion:<br>mg/mL –<br>0.01 mg/mL to 9.99 mg/mL in the increments of 0.01 mg/mL<br>10 mg/mL to 99.9 mg/mL in the increments of 0.1 mg/mL<br>100 mg/mL to 999 mg/mL in increments of 1mg/mL<br>mcg/mL –<br>0.01 mcg/mL to 9.99 mcg/mL, in the increments of 0.01 mcg/mL<br>10 mcg/mL to 99.9 mcg/mL in the increments of 0.1 mcg/mL<br>100 mcg/mL to 999 mcg/mL in increments of 1 mcg/mL |
| Loading Dose | Basic Infusion (All Routes):<br>mL: 0.1 mL to 10 mL in increments of 0.1 mL<br>mg; 0.1 mg to 10 mg in increments of 0.1 mg<br>mcg: 0.1 mcg to 50 mcg in increments of 0.1 mcg |

| PCA Delivery Specifications | |
|---|---|
| Basal Rate<br><br>(mg or mcg equivalents) | Basic Infusion (All Routes):<br>mL/hr: 0.1 mL/hr - 10 mL/hr in increment of 0.1 mL/hr<br>mg/hr: 0.1 mg/hr – 20 mg/hr in increments 0.1 mg/hr<br>mcg/hr: 0.1 mcg – 50 mcg/hr in increments of 0.1 mcg/hr<br><br>PSP Infusion:<br>IV Route - 0.1 mL/hr -100 mL/hr, equivalent for mg/hr and mcg/hr<br>EPI Route - 0.1 mL/hr - 35 mL/hr, equivalent for mg/hr and mcg/hr<br>SQ Route - 0.1 mL/hr -10 mL/hr, equivalent for mg/hr and mcg/hr |
| PCA Bolus<br><br>(mg or mcg equivalent) | Basic Infusion (All Routes):<br>mL: 0.1 mL - 10 mL in increments of 0.1 mL<br>mg; 0.1 mg - 10 mg in increments of 0.1 mg<br>mcg: 0.1 mcg - 50 mcg in increments of 0.1 mcg<br><br>PSP Infusion:<br>IV Route - 0.1 mL -50 mL, equivalent for mg/hr and mcg/hr<br>EPI Route - 0.1 mL -25 mL, equivalent for mg/hr and mcg/hr<br>SQ Route - 0.1 mL 10 mL, equivalent for mg/hr and mcg/hr |
| PCA bolus Lockout | 2 min to 24 hours in the increments of 1 min |
| Max # of boluses per hour | 0 to 30 |
| Clinician Bolus<br><br>(mg or mcg equivalents) | Basic Infusion (All Routes):<br>mL: 0.1 mL -10 mL in increments of 0.1 mL<br>mg: 0.1 mg - 10 mg in increments of 0.1 mg<br>mcg: 0.1 mcg - 50 mcg in increments of 0.1 mcg<br><br>For PSP Infusion:<br>When Enabled:<br>For IV Route - 0.1 mL - 50 mL, equivalent for mg or mcg<br><br>For EPI Route - 0.1 mL - 25 mL, equivalent for mg or mcg<br><br>For SQ Route - 0.1 mL- 10 mL, equivalent for mg or mcg |
| Delivery limit method | - 1 Hour Limit<br>- Max # Boluses per hr |

| PCA Delivery Specifications | |
|---|---|
| 1 Hour Limit | Basic Infusion: N/A<br><br>PSP Infusion: (All Routes)<br>mL: 0.1 mL - 500 mL<br>mg: 0.1 mg - 99999 mg<br>mcg: 0.1 mcg - 99999 mcg |
| Max Delivery Rate<br><br>(Combined bolus and continuous rate) | Basic Infusions:<br>IV Route – 135 mL/hr (10 mL/hr + 125 mL/hr)<br>EPI Route – 100 mL/hr (10 mL/hr + 90 mL/hr)<br>SQ Route – 70 mL/hr (10 mL/hr + 60 mL/hr)<br>(and mg or mcg equivalents)<br><br>PSP Infusions:<br>IV Route – 500 mL/hr (100 mL/hr + 400 mL/hr)<br>EPI Route – 435 mL/hr (35 mL/hr + 400 mL/hr)<br>SQ Route – 410 mL/hr (10 mL/hr + 400 mL/hr)<br>(and mg or mcg equivalents) |
| Bolus Delivery Rate | Basic Infusion<br>IV Route: 10 mL/hr – 125 mL/hr in increments of 0.1 mL/hr<br>EPI Route: 10 mL/hr – 90 mL/hr in increments of 0.1 mL/hr<br>SQ Route: 10 mL/hr – 60 mL/hr in increments of 0.1 mL/hr<br><br>PSP Infusion (All Routes)<br>10 mL/hr – 99.9 mL/hr in increments of 0.1<br>100 mL/hr - 400 mL/hr in increments of 1 mL/hr |

| TPN (Taper) Delivery Specifications | |
|---|---|
| Vol TBI | 0.2 mL – 99.9 mL in increments of 0.1 mL<br>100 mL – 9999 mL in increments of 1 mL |
| Plateau Rate | 10 mL/hr – 99.9 mL/hr in increments of 0.1 mL/hr<br>100 mL/hr – 500 mL/hr in increments of 1 mL/hr |
| Ramp Up | 0 min - 9:00 hr: min in increments of 1 minute |
| Ramp Down | 0 min - 9:00 hr: min in increments of 1 minute |
| Total Duration | 1 min - 288:00 hr: min in increments of 1 minute |

| Intermittent Delivery Specifications | |
|---|---|
| Dose Frequency | 1 min – 24 hr in increments of 1 minute |
| Amount Per Dose | 0.1 mL – 99.9 mL in increments of 0.1 mL<br>100 mL – 9999 mL in increments of 1 mL |
| Dose Duration | 1 min – 24:00 hr: min in increments of 1 minute |
| Dose Rate | 0.1 mL/hr – 99.9 mL/hr in increments of 0.1 mL/hr – 99.9 mL/hr<br>100 mL/hr – 500 mL/hr in increments of 1 mL/hr |
| Next Dose Start Time | 1 min – 23:55 hr: min in increments of 1 minute |

| Variable (Step) Therapy Delivery Specifications | |
|---|---|
| Number of Steps | 1 – 24 in increment of 1 |
| Step Amt TBI | 0.1 mL – 99.9 mL in increments of 0.1 mL<br>100 mL – 9999 mL in increments of 1 mL |
| Step Duration | 1 min to 24:00 in increments of 1 minute |
| Step Rate | 0.1 mL/hr to 99.9 mL/hr- in increments of 0.1 mL/hr<br>100 mL/hr to 500 mL/hr in increments of 1 mL/hr |

## CURLIN 8000 Specifications

| Item | Specification |
|---|---|
| Pumping Mechanism | Curvilinear peristaltic finger action |
| Pump Size<br>Height:<br>Width:<br>Depth:<br>Weight: | <br>5.5 inches<br>4.3 inches<br>2.75 inches<br>23.8 ounces (0.675 kg) with rechargeable battery pack)<br>24.4 ounces (0.691 kg) with 2 C-Cell batteries |
| Operating Environment Temperature:<br><br>Relative Humidity:<br><br>Atmospheric Pressure Range: | 15°C to 40°C (59°F- 104°F)<br><br>15% to 90% non-condensing<br><br>70 kPa to 106 kPa |
| Storage Environment<br>Storage Temperature Range:<br><br>Storage Relative Humidity:<br><br>Storage Pressure Range: | Normal Storage<br>Environmentally Controlled for Temperature and Humidity<br><br>Temporary or Transportation:<br>-20°C to 60°C (-4°F to 140°F)<br><br>15% to 93% non-condensing<br><br>50 kPa to 106 kPa |
| Typical time required for the pump to warm from -20°C to 15°C | 90 minutes |
| Typical time required for the pump to cool from 60°C to 40°C | 45 minutes |
| Solid object and fluid ingress protection | IP24 |
| Power Options | Rechargeable battery pack<br>AC power<br>2 Duracell Procell C-cell single-use batteries |
| Average operating time with fully charged C-cell batteries | 10 hours at 500 mL/hr<br>30 hours at 125 mL/hr<br>50 hours at 2 mL/hr |

| Item | Specification |
|---|---|
| Average operating time with fully charged rechargeable battery pack | 10 hours at 500 mL/hr<br>30 hours at 125 mL/hr<br>85 hours at 2 mL/hr |
| Rechargeable battery pack charge time | 8 hours |
| Expected Service Life<br>Pump<br><br>Accessories<br>Bolus Cord<br>AC adapter<br>Rechargeable battery<br>Data cable | <br>5 years<br><br><br>2 years<br>3 years<br>200 full charge/discharge cycles<br>1 year |
| Display | Graphic LCD |
| Flow rates | 0.1 to 500 mL/hr |
| KVO Rates | 0 to 9.9 mL/hr<br>Can be set at “0” in Continuous, TPN, Variable and Intermittent therapies |
| Priming Rate | 500 mL/hr<br>*Note: Air detector is off and accumulated air is reset when using the prime feature.* |

| Item | Specification | |
|---|---|---|
| Infusion Accuracy<br>Delivery rate<br>1 – 500 mL/hr<br>0.1 – 0.9 mL/hr<br><br>Bolus volume<br>>2.5 ml<br><2.5 ml | <br><br>± 5%<br>± 15%<br><br><br>± 5%<br>± 15% | |
| Accuracy testing conditions | Temperature: 22°C (72°F)<br>Head height: 12 inches<br>Back pressure: none<br><br>*Delivery and environmental factors may have additional impact on delivery accuracy. For factors impacting infusion accuracy, see page 185.*<br><br>*Infusion accuracy established at statistical levels of 90% reliability and 90% confidence.*<br>*Accuracy specification applies to all therapy modes, for the administration set usage period of 96 hours (or 9 Liters).* | |
| Administration Set Usage | Set use should not exceed 96 hours or 9 liters (whichever comes first). Pump performance may be affected beyond these limits | |
| Maximum volume that may be Infused Under Single Fault Conditions | 0.5 mL | |
| Notification and Alarm Audio | Pressure level (at 1m)<br>Min: 45db(A)<br>Max: 80db(A) | |
| Administration Sets | Non-DEHP, PVC administration sets available in different configurations<br><br>Warning: Use only approved Moog CURLIN 380 series Infusion sets | |
| Fill Volume for Administration Sets | See individual administration set label for specific fill volume | |
| Up Occlusion Detection Time<br>- occlusion below spike | Rate<br>0.1 mL/hr.<br>1 mL/hr.<br>25 mL/hr. | Time to Alarm<br>3-14 min<br>30-90 sec<br>3-8 sec |

<table>
<tr><th>Item</th><th colspan="4">Specification</th></tr>
<tr><td></td><td colspan="4">Note: Occlusion time ranges represent ±1 std dev.</td></tr>
<tr><td rowspan="5">Down Occlusion Detection Time<br>- occlusion at distal Luer for non-filtered sets:</td><td>Rate</td><td colspan="3">Time to Alarm</td></tr>
<tr><td></td><td>Low Sensitivity</td><td>Medium Sensitivity</td><td>High Sensitivity</td></tr>
<tr><td>0.1 mL/hr</td><td>1-2 hrs</td><td>32-46 min</td><td>20-32 min</td></tr>
<tr><td>1 mL/hr</td><td>8-11 min</td><td>2-6 min</td><td>2-3 min</td></tr>
<tr><td>25 mL/hr</td><td>16-20 sec</td><td>8-12 sec</td><td>5-9 sec</td></tr>
<tr><td colspan="4">Note: Occlusion time ranges represent ±1 std dev.</td></tr>
<tr><td rowspan="5">Down Occlusion Detection Time<br>- occlusion at distal Luer for filtered sets:</td><td>Rate</td><td colspan="3">Time to Alarm</td></tr>
<tr><td></td><td>Low Sensitivity</td><td>Medium Sensitivity</td><td>High Sensitivity</td></tr>
<tr><td>0.1 mL/hr.</td><td>3.5-4.5 hrs</td><td>1.5-2.5 hrs</td><td>1-1.5 hrs</td></tr>
<tr><td>1 mL/hr.</td><td>15-20 min</td><td>6-10 min</td><td>3-7 min</td></tr>
<tr><td>25 mL/hr.</td><td>40-60 sec</td><td>20-35 sec</td><td>15-25 sec</td></tr>
<tr><td colspan="4">Note: Occlusion time ranges represent ±1 std dev.<br><br>Note: Administration sets containing anti-siphon valves are not recommended at “high” sensitivity setting as false occlusion alarms may occur.</td></tr>
<tr><td>Bolus volumes following occlusion release (occlusion at distal Luer)<br><br>Bolus on door open/closed</td><td colspan="4">Non-filtered or 0.2µm filter sets <0.5mL<br>Sets containing 1.2µm filters <1.5 mL<br><br><0.3mL</td></tr>
</table>

## Factors Impacting Infusion Accuracy

The accuracy of the CURLIN 8000 pump when delivering an infusion can be impacted by the following factors:

- Pump use outside the stated operating environmental conditions can have a negative impact on pressure alarm and delivery accuracy performance.

**Caution** At rates below 1 mL/hr the infusion accuracy of the CURLIN 8000 can vary by as much as 15%.

Use of air eliminating filters below 1 mL/hr can result in under delivery variation up to -18%.

For infusions requiring higher accuracy at flow rates below 1 mL/hr, alternate infusion methods should be considered if tighter accuracy ranges are required.

- The time required to achieve the desired delivery rate varies based on the rate selected and the initial position of the pumping mechanism. The table below, as recommended in AAMI TIR101, provides guidance for the startup time to achieve steady state delivery. Note: negative time represents a period of higher delivery rate and positive time a period of lower delivery rate.

| **Administration Set Used** | **Fluid** | **Programmed Flow Rate** (mL/hr) | **Start-up Delay** (min) |
|---|---|---|---|
| 380 Series | Distilled Water | | |
| Operating Conditions (22C, 12" head height, no back pressure) | | 0.1 | -7.8 to 8.5 |
| | | 1 | -3.2 to 3.2 |
| | | 10 | -0.3 to 0.1 |
| | | 100 | 0.0 to 0.1 |
| | | 500 | 0.0 to 0.0 |

## Effect of Head Height on Infusion Rate Accuracy

The position of the reservoir fluid level is limited by the maximum length of the upstream tubing segment of the Curlin 8000 administration sets.

The reservoir's fluid level nominal position is 12 inches above the pump. Raising or lowering the reservoir could result in a delivery rate deviation of ± 1% per 12 inches.

## Effect of Back Pressure on Infusion Rate Accuracy

The position of the pump and reservoir relative to the infusion site is limited by the maximum length (approximately 54 inches) of the downstream tubing segment of the Curlin 8000 administration sets.

The patient's infusion site nominal position is to be level with the pump. Raising or lowering the pump relative to the infusion site could result in a delivery rate deviation of ± 1% per 54 inches (100mmHg).

## Viscosity Effects on Infusion Rate Accuracy

The Curlin 8000 is effective in delivering fluids used within its intended use therapies. Fluids with increased viscosity such as IVIG (up to 3.5cP) have been shown to deliver according to the device's specifications (tested using D50W). However, fluids with viscosities above 3.5cP may result in a lower delivery accuracy.

Additional guidance for small delivery volumes, therapy startup, back pressure, bolus delivery, flow continuity, non-continuous delivery modes and administration set life impacts are provided below consistent with IEC 60601-2-24

## Start-up Curves and Trumpet Curves

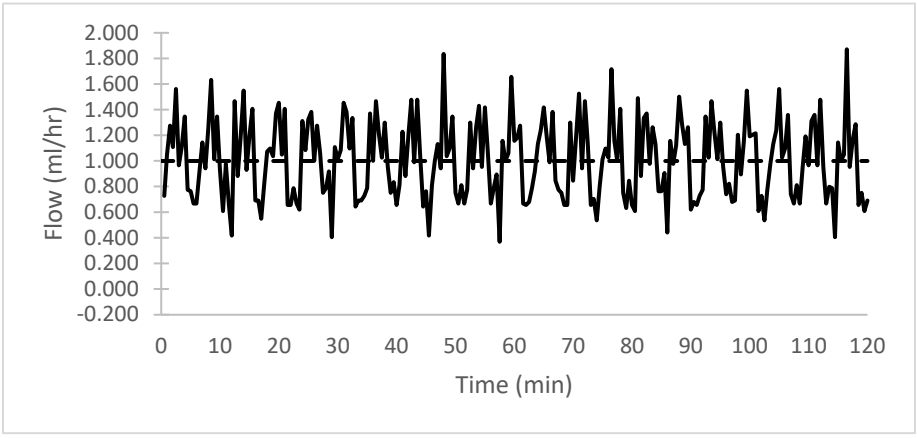


**Figure 17-1: Start-up Graph for First Two Hours of CURLIN 8000 Pump Delivering at 1 ml/hr**

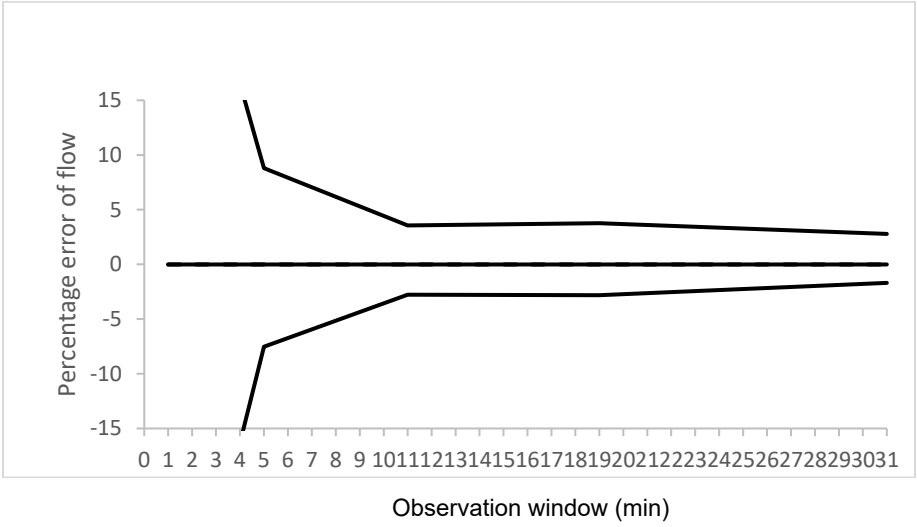


**Figure 17-2: Trumpet Curve for Second Hour of CURLIN 8000 Pump Delivering at 1 ml/hr**

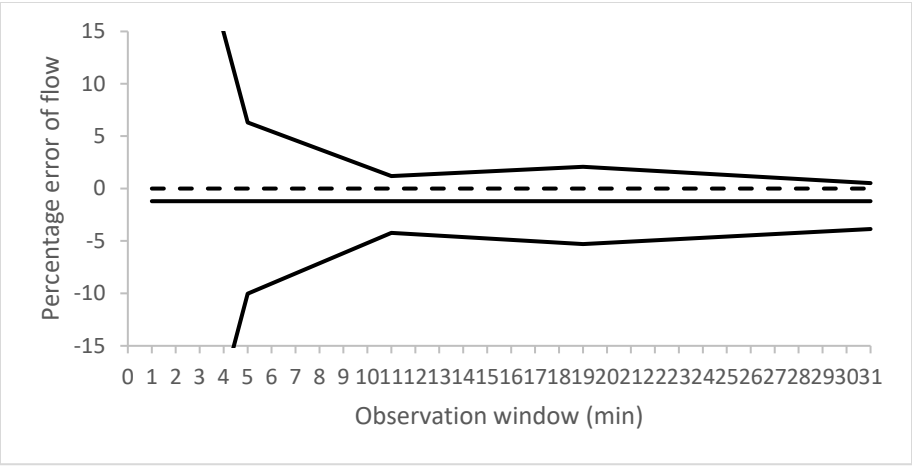


**Figure 17-3: Trumpet Curve for 96th Hour of CURLIN 8000 Pump Delivering at 1 ml/hr**

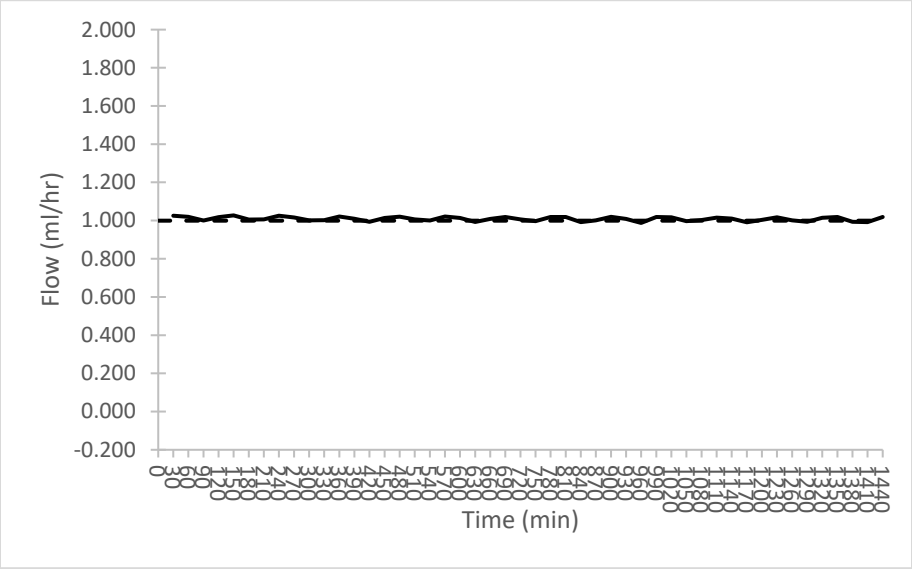


**Figure 17-4: Start-up Graph for First 24 Hours of CURLIN 8000 Pump Delivering at 1 ml/hr**

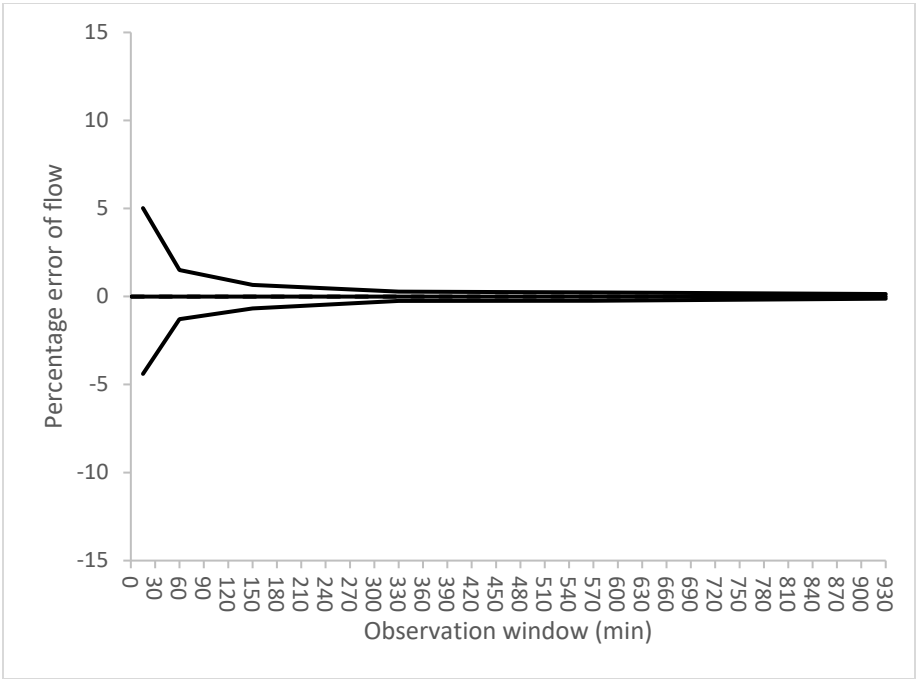


**Figure 17-5: Trumpet Curve for 25th-49th Hours of CURLIN 8000 Pump Delivering at 1 ml/hr**

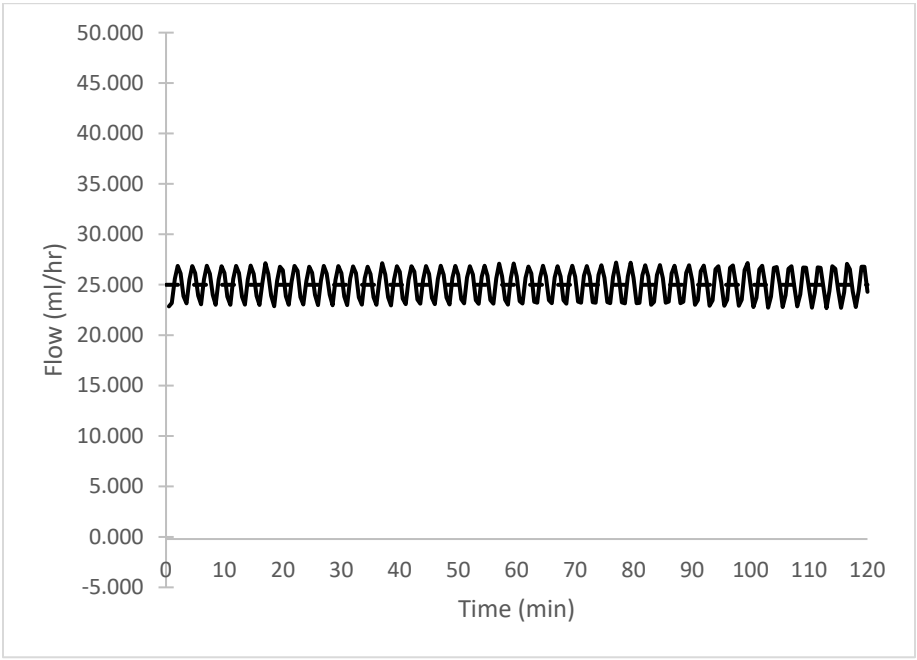


**Figure 17-6: Start-up Graph for First Two Hours of CURLIN 8000 Pump Delivering at 25 ml/hr**

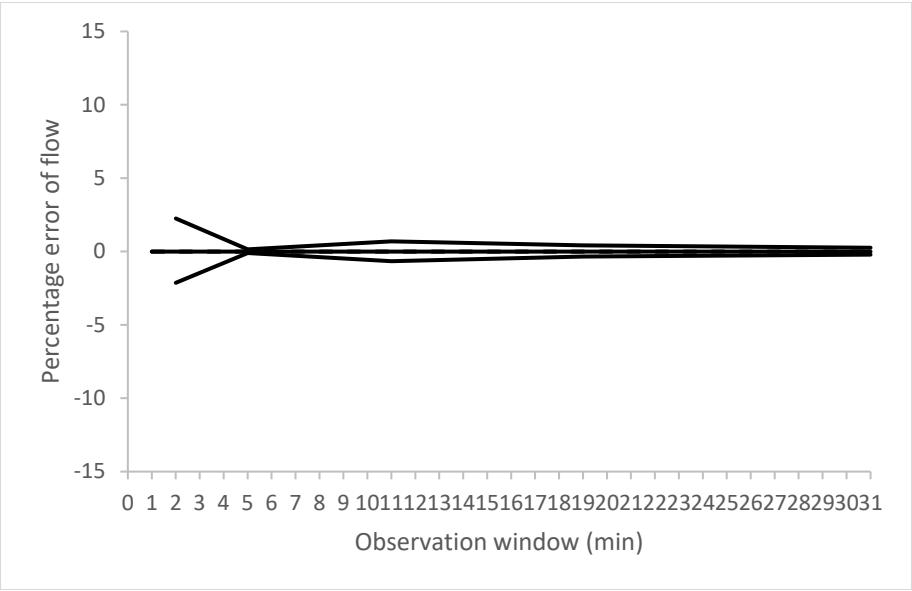


**Figure 17-7: Trumpet Curve for Second Hour of CURLIN 8000 Pump Delivering at 25 ml/hr**


**Figure 17-8: Trumpet Curve for 96th Hour of CURLIN 8000 Pump Delivering at 25 ml/hr**

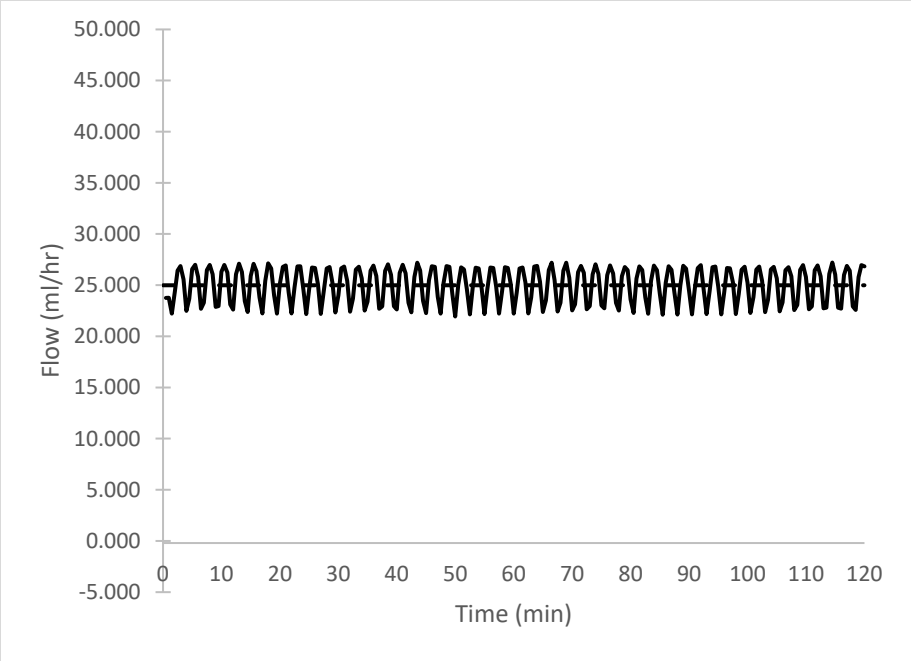


**Figure 17-9: Start-up Graph for First Two Hours of CURLIN 8000 Pump Delivering at 25 ml/hr with Zero Backpressure**

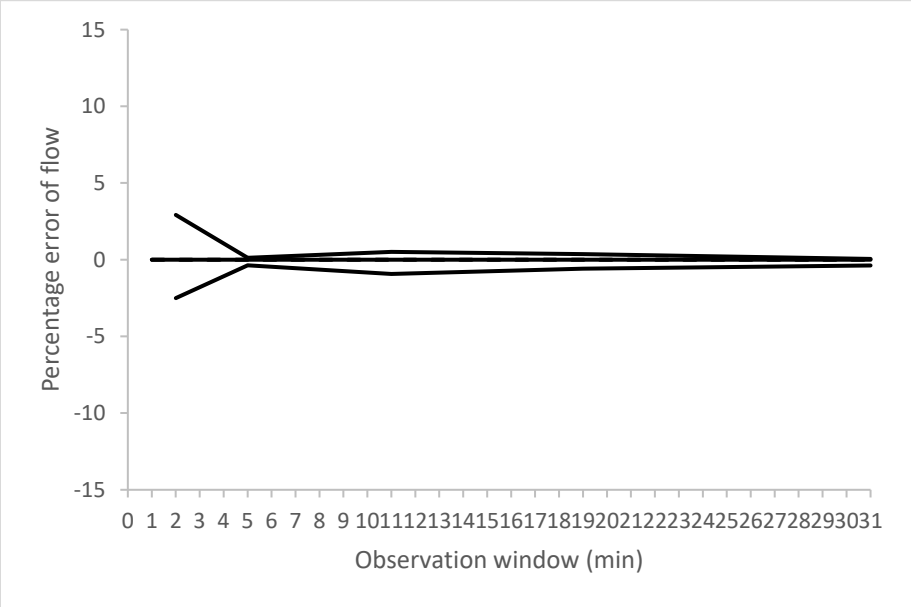


**Figure 17-10: Trumpet Curve for Second Hour of CURLIN 8000 Pump Delivering at 25 ml/hr with Zero Backpressure**

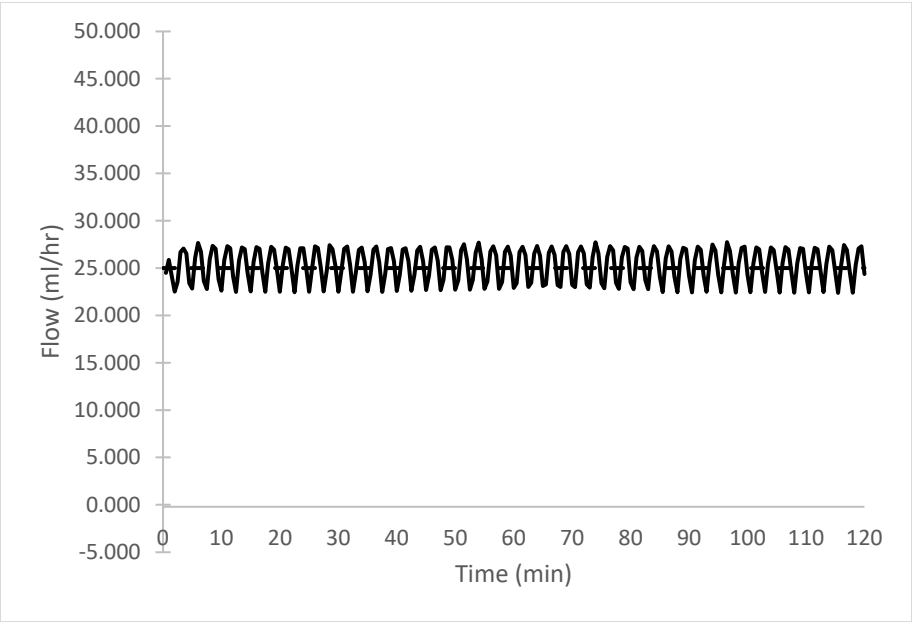


**Figure 17-11: Start-up Graph for First Two Hours of CURLIN 8000 Pump Delivering at 25 ml/hr with -100 mmHg Backpressure**

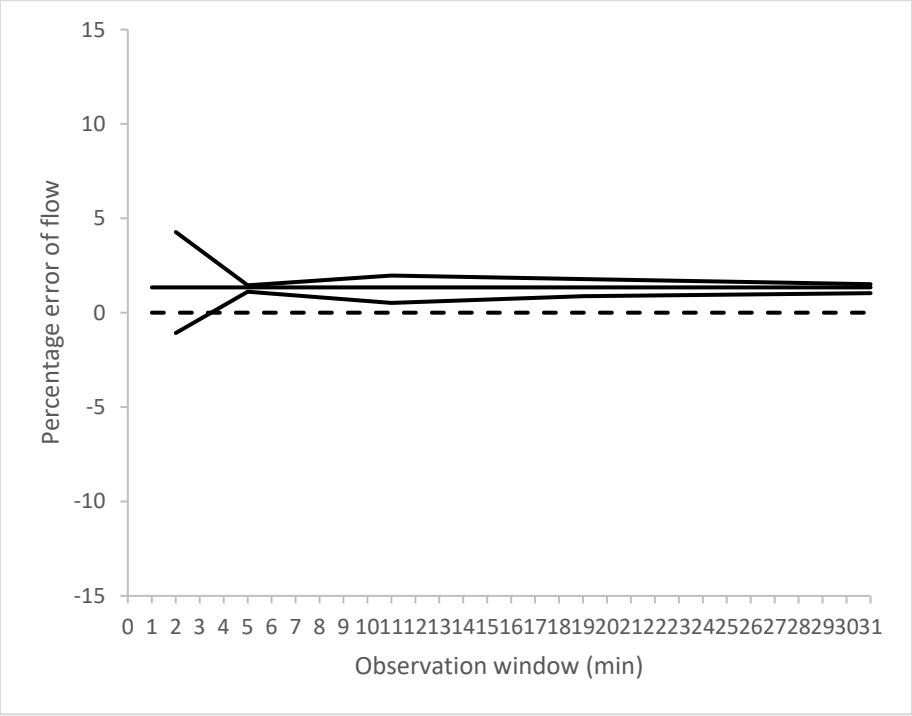


**Figure 17-12: Trumpet Curve for Second Hour of CURLIN 8000 Pump Delivering at 25 ml/hr with -100 mmHg Backpressure**

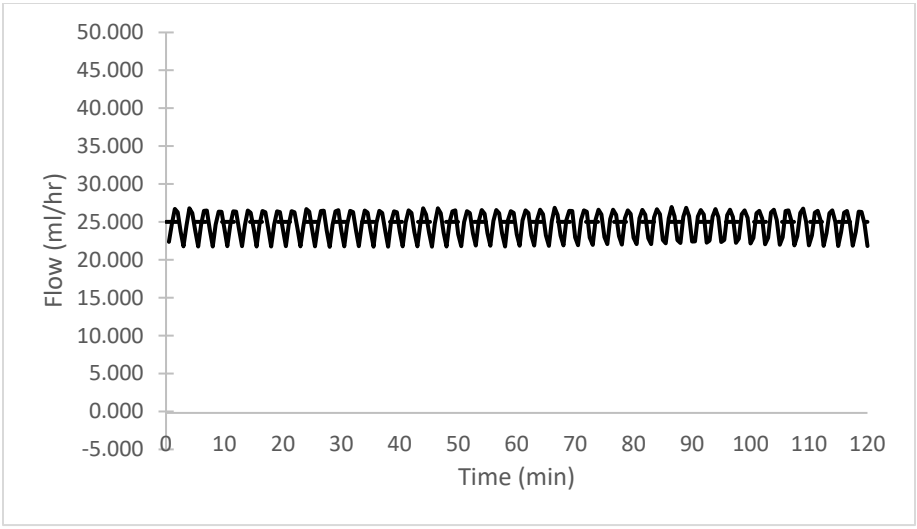


**Figure 17-13: Start-up Graph for First Two Hours of CURLIN 8000 Pump Delivering at 25 ml/hr with 100 mHg Backpressure**

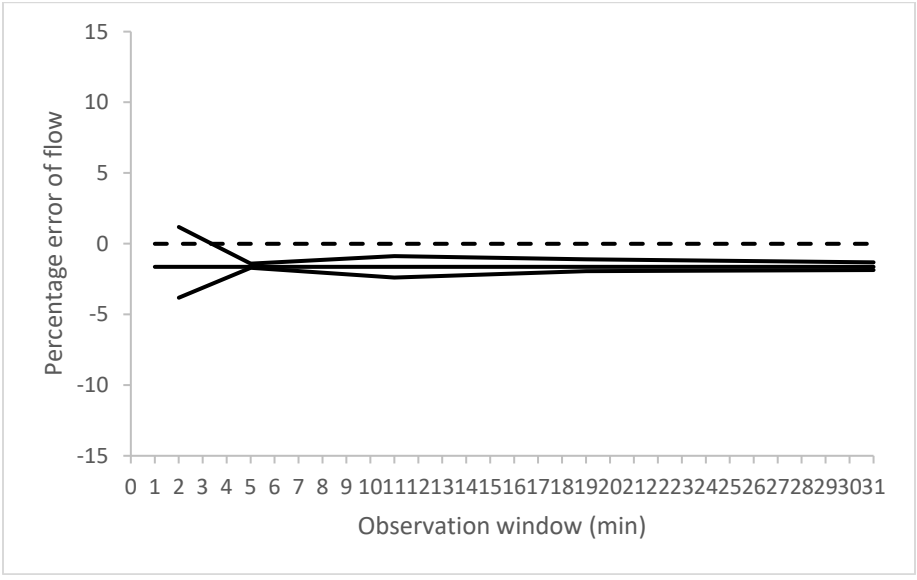


**Figure 17-14: Trumpet Curve for Second Hour of CURLIN 8000 Pump Delivering at 25 ml/hr with 100 mmHg Backpressure**

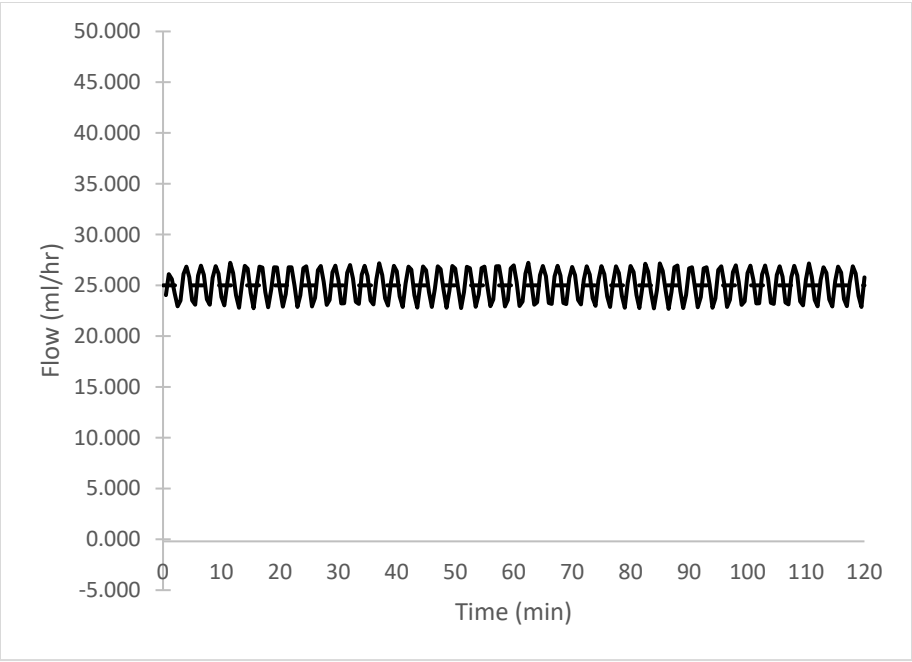


**Figure 17-15: Start-up Graph for First Two Hours of CURLIN 8000 Pump Delivering at 25 ml/hr at Standard Head Height (+0.3 m/12 in)**

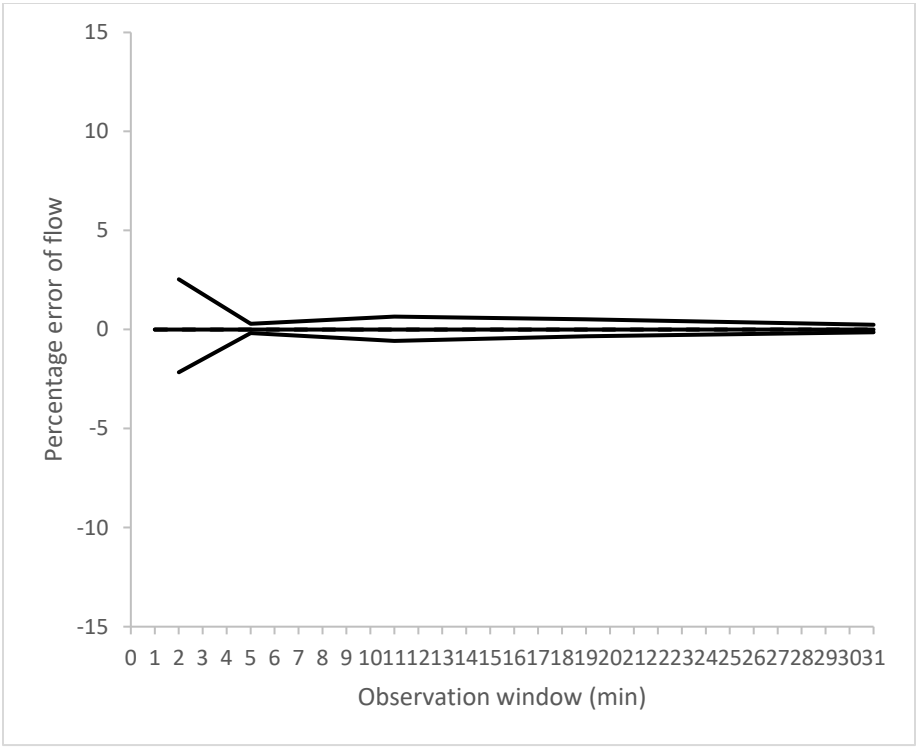


**Figure 17-16: Trumpet Curve for Second Hour of CURLIN 8000 Pump Delivering at 25 ml/hr at Standard Head Height (+0.3 m/+12 in)**

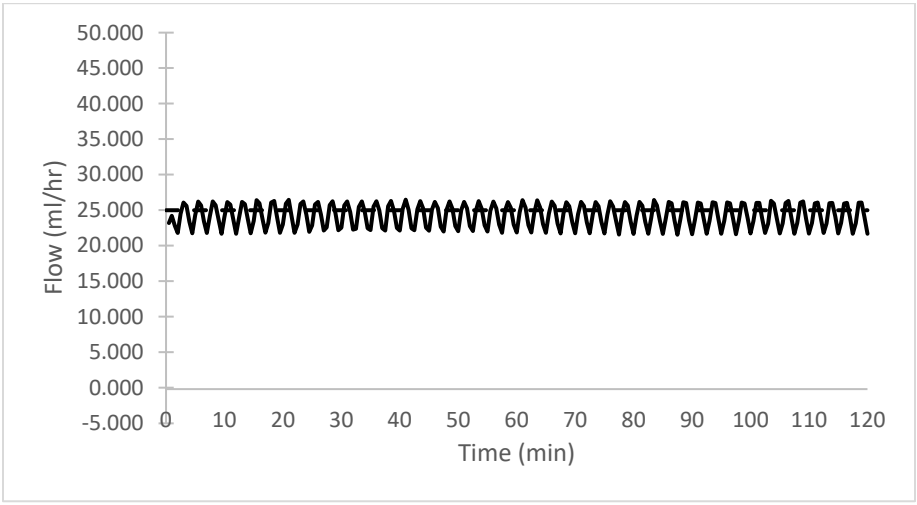


**Figure 17-17: Start-up Graph for First Two Hours of CURLIN 8000 Pump Delivering at 25 ml/hr at -0.5 m/-19.7 in Head Height**

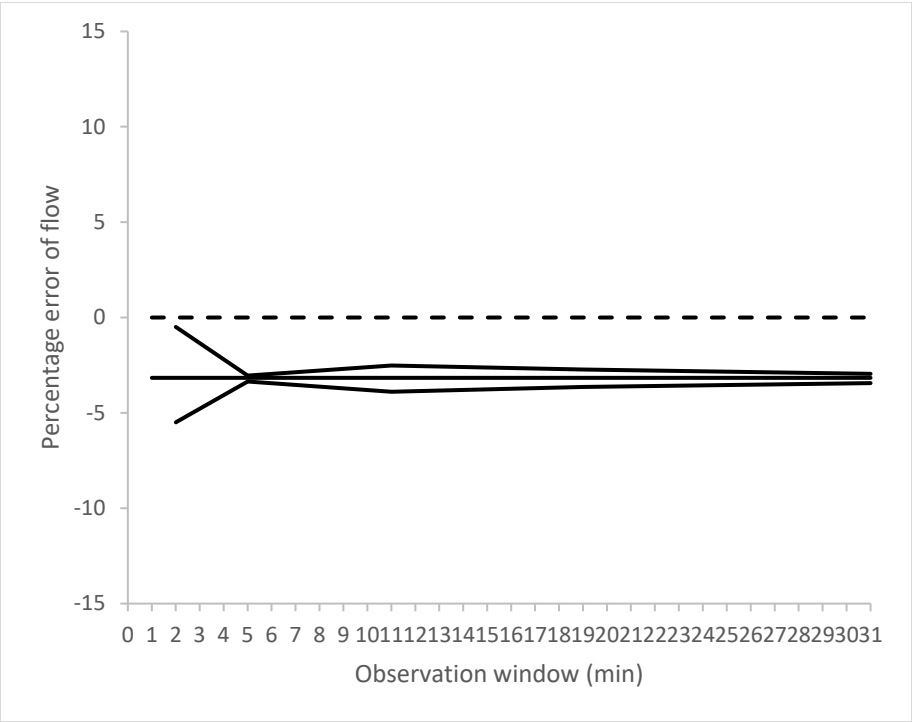


**Figure 17-18: Trumpet Curve for Second Hour of CURLIN 8000 Pump Delivering at 25 ml/hr at -0.5 m/-19.7 in Head Height**

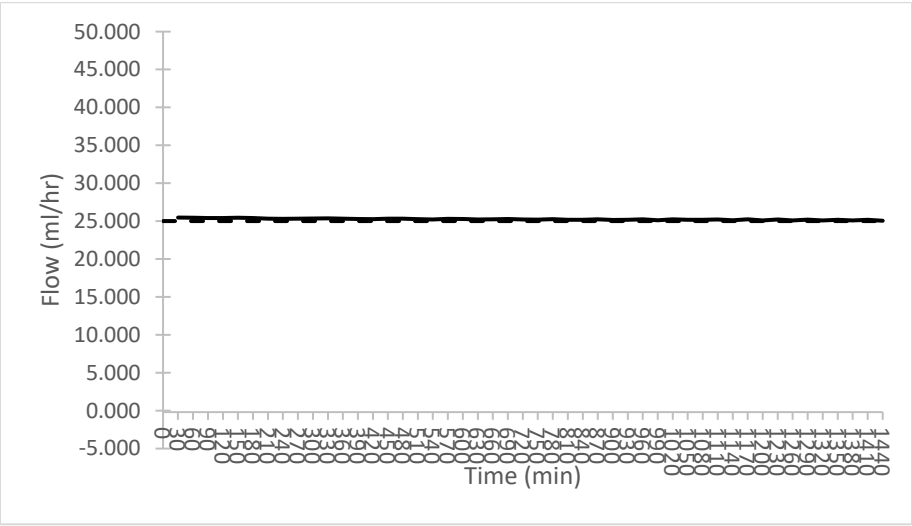


**Figure 17-19: Start-up Graph for First 24 Hours of CURLIN 8000 Pump Delivering at 25 ml/hr**

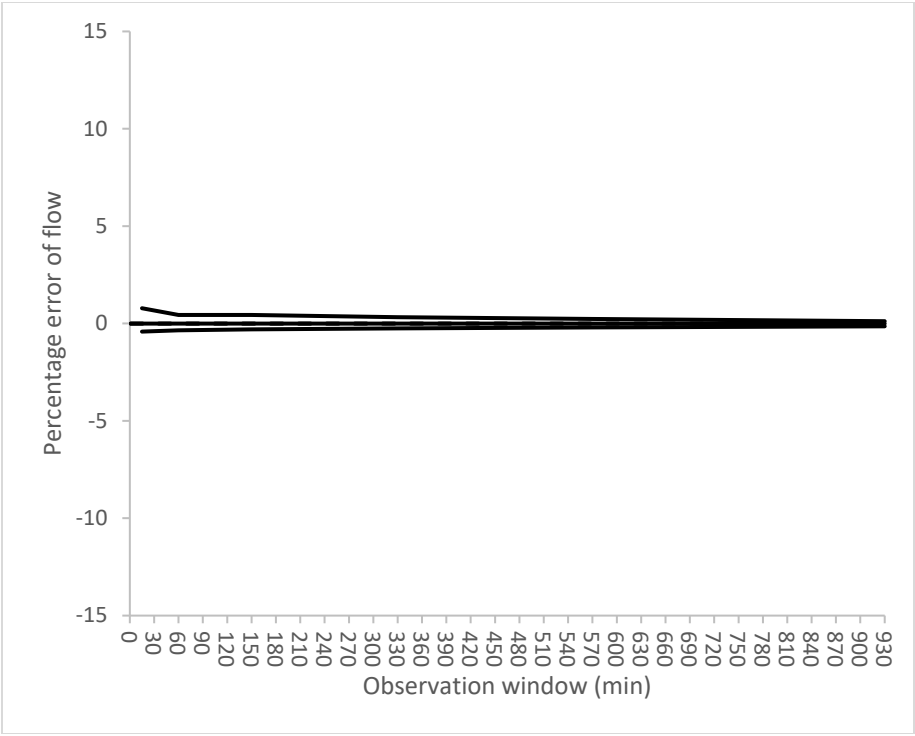


**Figure 17-20: Trumpet Curve for 25th-49th Hours of CURLIN 8000 Pump Delivering at 25 ml/hr**

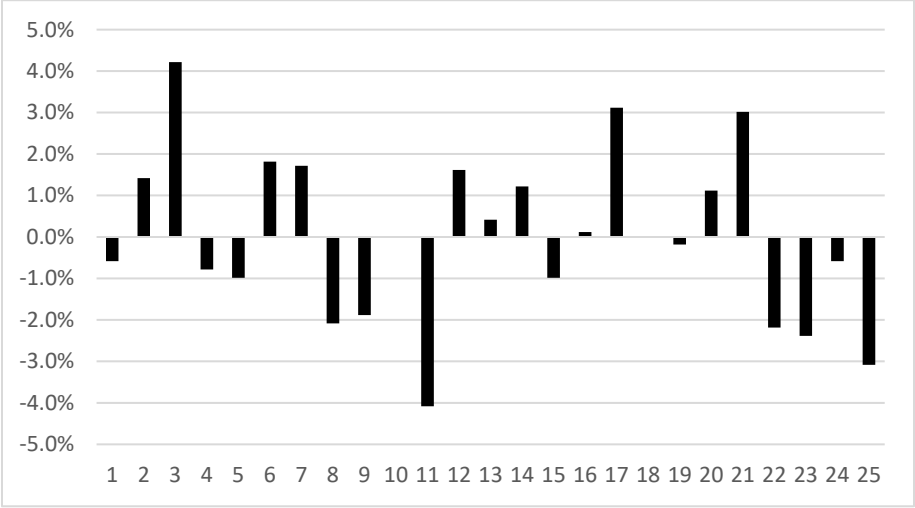


**Figure 17-21: CURLIN 8000 Pump Delivering 25 Successive Boluses of 0.1 ml in PCA EPI Mode**

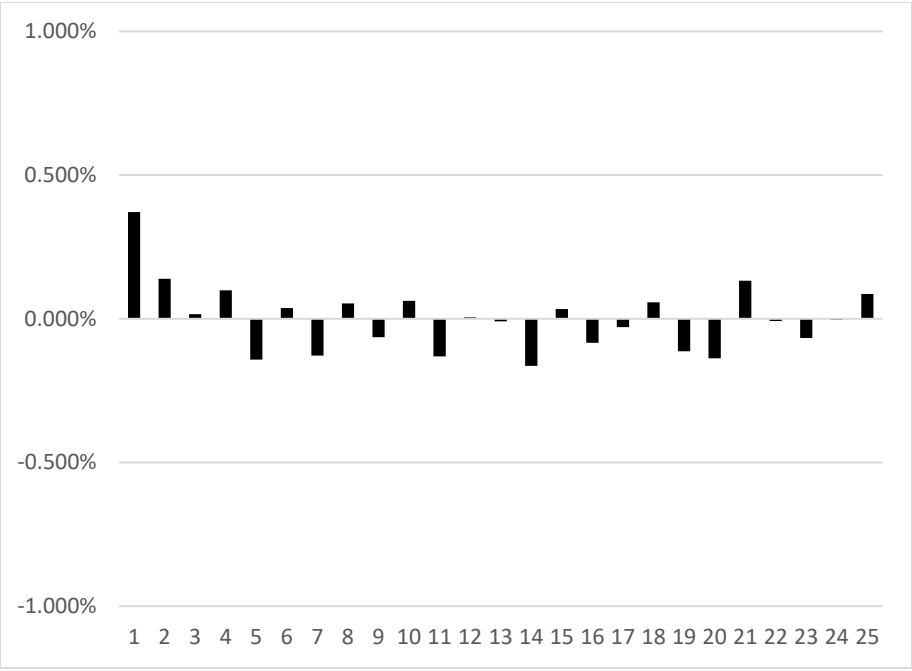


**Figure 17-22: CURLIN 8000 Pump Delivering 25 Successive Boluses of 10 ml in PCA EPI Mode**

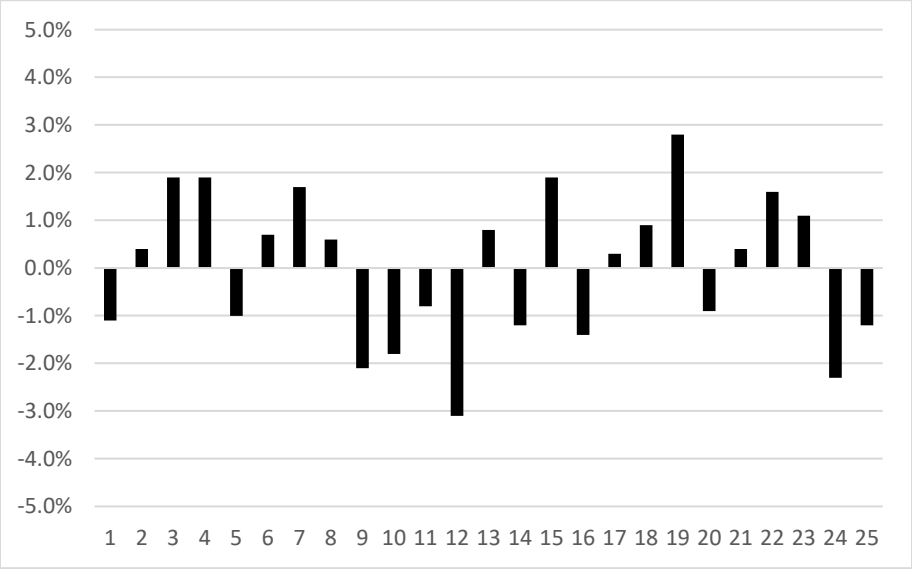


**Figure 17-23: CURLIN 8000 Pump Delivering 25 Successive Boluses of 0.1 ml in PCA SQ Mode**

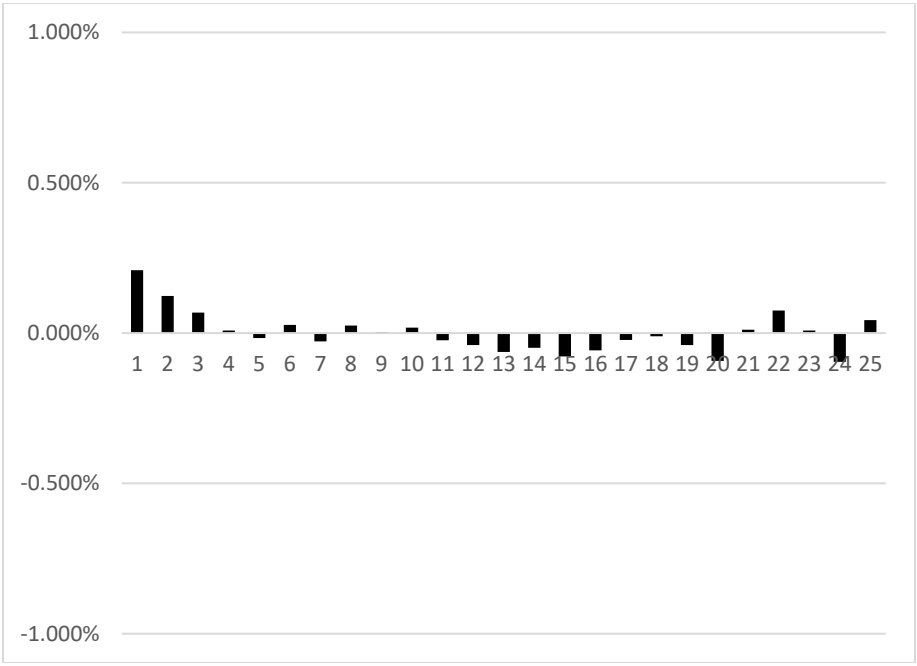


**Figure 17-24: CURLIN 8000 Pump Delivering 25 Successive Boluses of 10 ml in PCA SQ Mode**

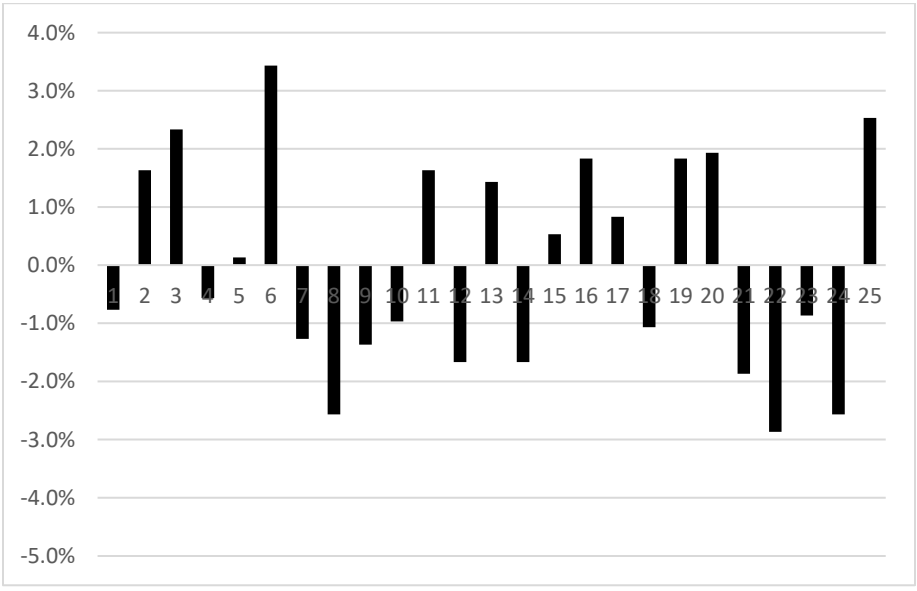


**Figure 17-25: CURLIN 8000 Pump Delivering 25 Successive Boluses of 0.1 ml in PCA IV Mode**

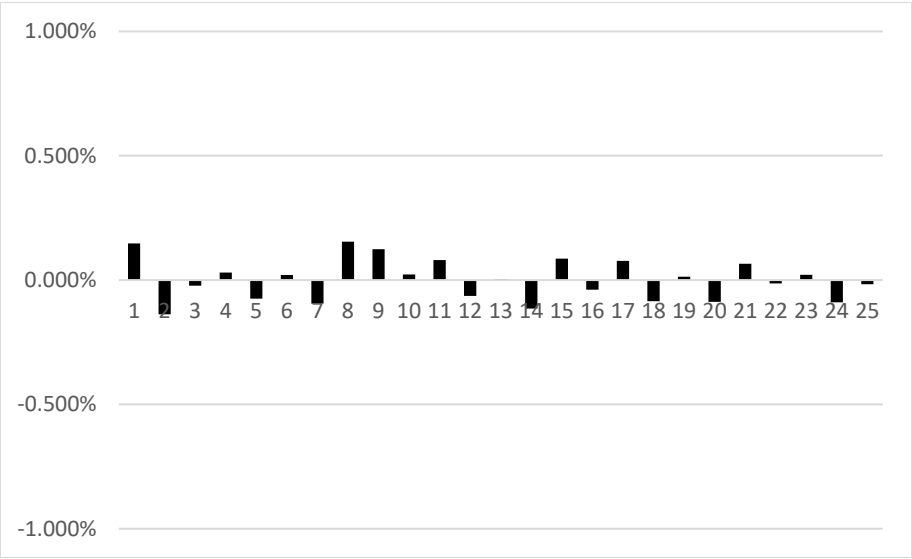


**Figure 17-26: CURLIN 8000 Pump Delivering 25 Successive Boluses of 10 ml in PCA IV Mode**

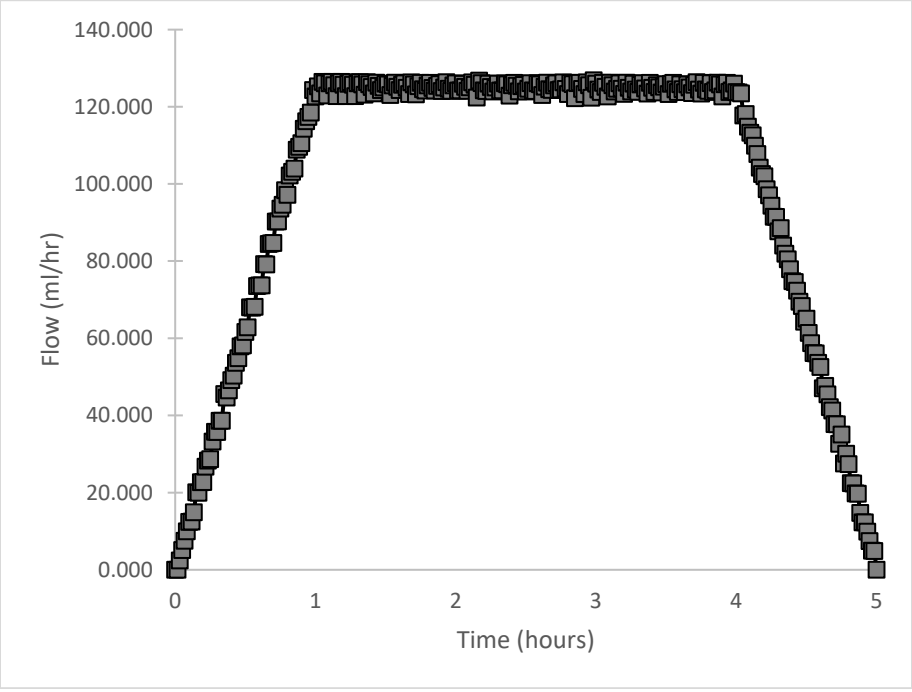


**Figure 17-27: CURLIN 8000 Pump Delivering in TPN Mode at 125 ml/hr with 1 Hour Ramp Up and 1 Hour Ramp Down**

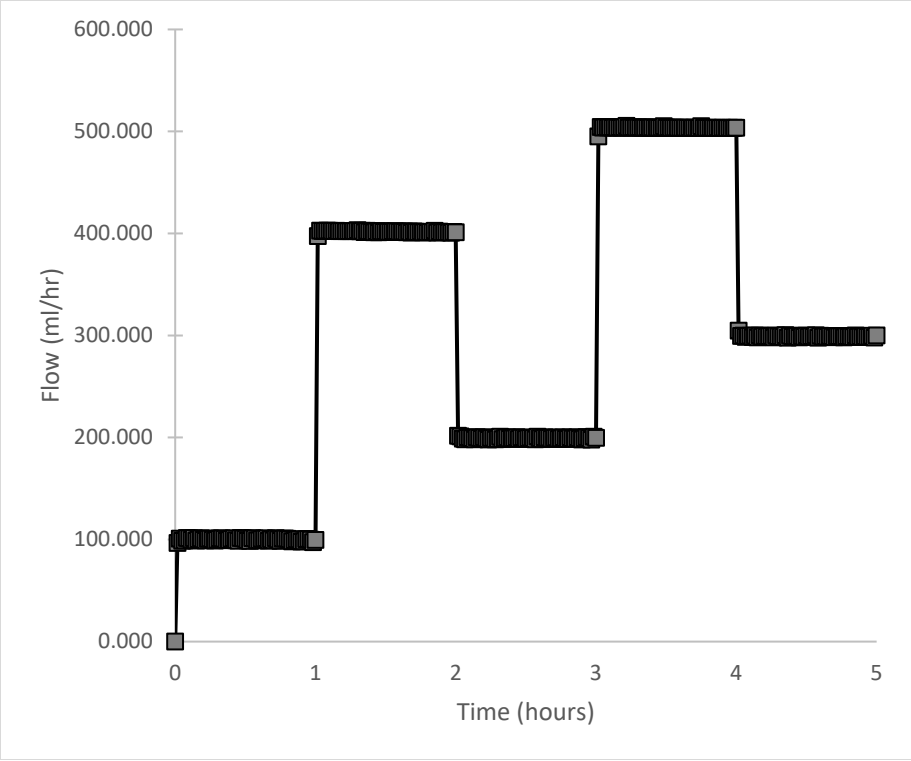


**Figure 17-28: CURLIN 8000 Pump Delivering in Variable Mode at 100, 400, 200, 500, then 300 ml/hr**

## Guidance and Manufacturer's Declaration – Electromagnetic Emissions

The CURLIN 8000 pump is intended for use in the electromagnetic environment specified below. The customer or the user of the CURLIN 8000 pump should be assured that it may be used in such an environment.

| Emissions Test | Compliance | Electromagnetic Environment – Guidance |
|---|---|---|
| Radiated / Conducted RF emissions<br>EN 55011 CISPR 11 | Group 1 | The CURLIN 8000 pump uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment. |
| Radiated / Conducted RF emissions<br>EN 55011 CISPR 11 | Class B | The CURLIN 8000 pump is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes. |
| Harmonic Distortion<br>IEC 61000-3-2 | Class A | |
| Voltage fluctuations / flicker emissions<br>IEC 61000-3-3 | Complies | |

## Guidance and Manufacturer's Declaration – Electromagnetic Immunity

The CURLIN 8000 pump is intended for use in the electromagnetic environment specified below. The customer or the user of the CURLIN 8000 pump should be assured that it may be used in such an environment.

| Immunity test | IEC 60601 Test Level | Compliance Level | Electromagnetic Environment – Guidance |
|---|---|---|---|
| Electrostatic discharge (ESD)<br><br>IEC 61000-4-2 | ±2kV, ±4kV, and ±8kV contact<br><br>±2kV, ±4kV, ±8kV, and ±15 kV air | ±2kV, ±4kV, and ±8kV contact<br><br>±2kV, ±4kV, ±8kV, and ±15 kV air | For best protection from ESD, avoid using the CURLIN 8000 pump in environments that promote high levels of static discharge (e.g., synthetic floor materials in low humidity environments). |
| Electrostatic fast transient / burst<br><br>IEC 61000-4-4 | ± 2 kV @100kHz PRR for power supply lines<br><br>± 1 kV @100kHz PRR for input/output lines | ± 2 kV @100kHz PRR for power supply lines<br><br>± 1 kV @100kHz PRR for input/output lines | Mains power quality should be that of a typical hospital, acute care, long term care, or residential environment. |
| Surge<br><br>IEC 61000-4-5 | ± 1 kV line(s) to line(s) | ± 1 kV line to line | Mains power quality should be that of a typical hospital, acute care, long term care, or residential environment. |

| Immunity test | | | IEC 60601 Test Level | Compliance Level | Electromagnetic Environment – Guidance |
|---|---|---|---|---|---|
| Voltage dips, short interruptions, and voltage variations on power supply input lines<br><br>IEC 61000-4-11 | | | 100% for 0.5 cycle at 0/40/90/135/180/225/270 & 315 degrees<br><br>100% for 1 cycle<br><br>30% for 25/30 cycles<br><br>100% for 250/300 | 100% for 0.5 cycle at 0/40/90/135/180/225/270 & 315 degrees<br><br>100% for 1 cycle<br><br>30% for 25/30 cycles<br><br>100% for 250/300 | Mains power quality should be that of a typical hospital, acute care, long term care, or residential environment. The CURLIN 8000 pump allows continued operation during power mains interruptions via the internal battery. |
| Power frequency (50/60 Hz) magnetic field<br><br>IEC 61000-4-8 | | | 30 A/m<br>50/60 Hz | 30 A/m<br>50/60 Hz | Power frequency magnetic fields should be at levels characteristic of a typical location in the typical residential, commercial or hospital environment. |
| Proximity Magnetic Fields<br><br>IEC 61000-4-39 | | | 30 kHz CW 8 A/m<br><br>9kHz – 150kHz Clause 5.3 L4 30 A/m<br><br>150kHz – 26MHz Clause 5.4 L4 3 A/m | 30 kHz CW 8 A/m<br><br>9kHz – 150kHz Clause 5.3 L4 30 A/m<br><br>150kHz – 26MHz Clause 5.4 L4 3 A/m | RFID, WPT and similar equipment may be used near the CURLIN 8000 pump so long as the radiated energy levels do not exceed those shown as complied with. |
| Conducted RF<br><br>IEC 61000-4-6 | 150 kHz to 80 MHz<br>3Vrms / 6Vrms (ISM)<br>80% AM at 1 kHz | 150 kHz to 80 MHz<br>3Vrms / 6Vrms (ISM)<br>80% AM at 1 kHz | Avoid using the CURLIN 8000 pump in close proximity to electronic devices or equipment that emit high levels of radiofrequency (RF) energy, such as X-ray and magnetic resonance imaging equipment. | | |

| Immunity test | IEC 60601 Test Level | Compliance Level | Electromagnetic Environment – Guidance |
|---|---|---|---|
| Radiated RF<br><br>IEC 61000-4-3 | 80 MHz to 2.7 GHz<br>80% AM at 1 MHz<br>10 V/m | 80 MHz to 2.7 GHz<br>80% AM at 1 MHz<br>10 V/m | |

IEC 61000-4-3 Radiated RF - Proximity fields (IEC 60601-1-2 Clause 8.10 Table-9)

| Proximity test frequency (MHz) | Band (MHz) | Service | Modulation | Compliance Level (V/m) | |
|---|---|---|---|---|---|
| 385 | 380 to 390 | TETRA 400 | | Pulse modulation 18 Hz | 27 |
| 450 | 430 to 470 | GMRS 460, FRS 460 | | FM ±5 kHz deviation 1 kHz sine | 28 |
| 710<br>745<br>780 | 704 to 787 | LTE Band 13, 17 | | Pulse modulation 217 Hz | 9 |
| 810<br>870<br>930 | 800 to 960 | GSM 800/900, TETRA 800, IDEN 820, CDMA 850, LTE Band 5 | | Pulse modulation 18 Hz | 28 |
| 1720<br>1845<br>1970 | 1700 to 1990 | GSM 1800, CDMA 1900, GSM 1900, DECT, LTE Band 1, 3, 4, 25, UMTS | | Pulse modulation 217 Hz | 28 |
| 2450 | 2400 to 2570 | Bluetooth, WLAN, 802.11 b/g/n, RFID 2450, LTE Band 7 | | Pulse modulation 217 Hz | 28 |
| 5240 | 5100 to 5800 | WLAN 802.11 a/n | | Pulse modulation 217 Hz | 9 |
| 5500<br>5785 | | | | | |

**Note:** These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.

| Proximity test frequency (MHz) | Band (MHz) | Service | Modulation | Compliance Level (V/m) | |
|---|---|---|---|---|---|
| | | | | | Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the CURLIN 8000 pump is used exceeds the applicable RF compliance level above, the CURLIN 8000 pump should be observed to verify normal operation and essential performance*. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the CURLIN 8000 pump. Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m. |

**Essential performance refers to the following performance parameters considered essential for the safe operation of the Curlin 8000 infusion system.*

*Delivery Accuracy*
*Occlusion Detection*
*Air in Line Detection*
*Free Flow protection (refer to the administration set IFU)*
*Equipment Malfunction Alarms (see chapter 14)*

*These performance parameters should be aligned with the patient needs and infusion expectation when selecting the Curlin 8000 system see section 17 for performance specified (section 17).*

# Index

## Notes

For over 20 years, Moog Medical has been designing industry-leading curvilinear peristaltic infusion pumps. Our infusion expertise and collaboration with customers and patients continues to benefit healthcare delivery and enhance caregiver and patient outcomes.


Speak live with a Moog Clinical Representative for pump questions and troubleshooting guidance 24 hours per day, 7 days per week.

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carbon neutral
All Moog Administration and Delivery Sets are manufactured at a carbon neutral facility.

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Enriching Lives.™