Micro Infusion Pump iPRECIO®

Specifications

Infusion Method: Rotary Finger Method (patented peristalsis)
Reservoir: 900μL, built-in Elastic Reservoir (Medical Grade SBS)
Tubing:
- Inner Tubing (Material: Medical Grade SBS, Soft Series)
  - Inner Diameter: 0.57mm / 0.022in
- Outer Tubing (Material: Medical Grade SBS, Soft Series)
  - Inner Diameter: 0.57mm / 0.022in
  - Length of Outer Tube: approx. 135mm
Activation Method:
- IR Communication
- Range of Flow Rate: 1.0μL/hr to 30.0μL/hr (0.1μL/hr resolution)
- Accuracy: < ±5% (under 0 - 80cmH₂O pressure)
- Battery Life: 6 Months at 1.0μL/hr - 1 Week at 30.0μL/hr
- Size/Weight: 38.7(L) x 19.2(W) x 9.7(H) mm / 7.9g
- Type of Usage: Disposable
- Package: EO Sterilized blister package (5pcs / box)

Infusion Method:
- Rotary Finger Method

Reservoir:
- Built-in Elastic Reservoir (Medical Grade SBS)
  - Material: Medical Grade SEBS (Olefin Series)
  - Inner Diameter: 0.57mm / 0.022in

Tubing:
- Material: Medical Grade SEBS (Olefin Series)
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iPRECIO® Management System

- Management of infusion protocol:
  - Study name, number ID, Date, Experiment Period, Section name, Operator, Number of Groups/Animals,
  - Animal Species, Strain, Age, Compound Name/ID, Concentration, Buffer Name, Administration Route, etc.

- Automated recognition of pump ID/Calibration Factor

- Pump Programming via PC
  - Programmable Parameters:
    - Start date/time, Stop date/time, and Flow rate.
  - Infusion Mode Selection:
    - 1. Instant Infusion Mode
    - 2. Post Recovery (Delayed) Infusion Mode
  - Flow Rate Mode Selection:
    - 1. Constant Flow Rate Mode
    - 2. Variable Flow Rate Mode (maximum: 10 flow rate steps)
    - Tit Variable Flow Rate Mode: Rapid Mode is selectable.
  - Dead Volume Setting:
    - Diameter, length, or Actual volume

- Flush setting:
  - Flush rate and Exchange Schedule
  - Schedule Management (Exchange schedule, Refill date/time, Alarm,
    Elapsed time & volume infused, etc.)

- Re-calibration of iPRECIO pump

- Upload of Pump’s log

iPRECIO® Data Communication Device

- Interface:
  - USB / Serial Interface
- Communication with Pump:
  - 91 Communication
- Power Supply:
  - PC USB or AAA batteries
- Size / Weight:
  - 120(L) x 67(W) x 35 (H) mm / 147g (with batteries)
- Accessories:
  - 1 USB cable (1m), 2 AAA batteries

The iPRECIO® is for use in Laboratory Animal Research ONLY. Not for human use.

Micro Infusion Pump

Implantable, Programmable and Refillable

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Phone: +81-3-3816-0851 Fax: +81-3-3814-5080
iPRECIO is an Ultimate Choice

“This implantable infusion pump uses a patented, microprocessor controlled peristalsis mechanism for accurate controlled flow. It is the only implantable and programmable pump for small laboratory animals. iPRECIO can infuse fluids continuously for as long as six months and it can be refilled via a percutaneously accessible port.”

- Accurate patented Rotary Finger Method
  - Every pump is factory tested and calibrated
  - Better than ±5% accuracy
  - 1 µL/hour to 30.0 µL/hour in 0.1 µL/hour steps
  - 291 discrete infusion flow-rates
  - Programmable infusion protocols (simple and complex)
  - Battery life of up to 6 months (continuous 1.0 µL/hour)

- Totally implanted in subcutaneous space

- Refillable (reservoir) percutaneously via refill port with re-sealable septum

- With iPRECIO catheters, test your drug’s effects nearly anywhere

- Easy to use menu driven software for infusion protocol programming

- Implantable
  - Tetherless, free moving animal model
  - No exit wounds (reduced infection risk)
  - No wires or connections to animal to allow stress free infusion

- Recovery Period
- Dose Escalation/De-escalation Studies
- Wash-out periods
- Complex Infusions
  - (daily/weekly repeat dosage, circadian rhythm, …)

- Programmable
  - Complex pharmacokinetic and tolerance studies based infusion protocols including constant continuous dose, circadian rhythm infusion to complex “oral dosage simulations” three times per day.
  - Further, iPRECIO enables to test the relevance of dosing time or dosing protocol on the therapeutic index of small and large molecules.

- Refillable
  - Multiple drugs
  - Multiple solvents/vehicles
  - Multiple concentrations of drug(s)

Increase study effectiveness by testing multiple drugs/vehicles within one animal. This enhanced flexibility is made possible by using wash-out periods between drug administration when only saline is infused to keep the catheter patent.
The World’s First Totally Implantable, Programmable Micro Infusion Pump for Small Laboratory Animals

Micro Infusion Pump iPRECIO®

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  - Every pump is factory tested and calibrated
  - Better than ±5% accuracy
  - 1μL/hour to 30.0μL/hour in 0.1μL/hour steps
  - 291 discrete infusion flow-rates
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- Totally implanted in subcutaneous space
- Refillable (reservoir) percutaneously via refill port with re-sealable septum
- With iPRECIO® catheters, test your drug’s effects nearly anywhere
- Easy to use menu driven software for infusion protocol programming

iPRECIO® 3 Key Features and Benefits

- **Implantable**
  - Tetherless free moving animal model
  - No exit wounds (reduced infection risk)
  - No wires or connections to animal to allow stress free infusion

- **Programmable**
  - Recovery Period
  - Dose Escalation/De-escalation Studies
  - Wash-out periods
  - Complex Infusions
    - Daily/weekly repeat dosage, circadian rhythm, ...
  - Complex pharmacokinetic and tolerance studies based infusion protocols including constant continuous dose, circadian rhythm infusion to complex “oral dosage simulations” three times per day. Further, iPRECIO® enables to test the relevance of dosing time or dosing protocol on the therapeutic index of small and large molecules.

- **Refillable**
  - Multiple drugs
  - Multiple solvents/vehicles
  - Multiple concentrations of drug(s)
  - Increase study effectiveness by testing multiple drugs/vehicles within one animal.

iPRECIO® is an Ultimate Choice

“This implantable infusion pump uses a patented, microprocessor controlled peristalsis mechanism for accurate controlled flow. It is the only implantable and programmable pump for small laboratory animals. iPRECIO® can infuse fluids continuously for as long as six months and it can be refilled via a percutaneously accessible port.”

iPRECIO® is an Ultimate Choice

Combination of “Refillable” and “Programmable” makes iPRECIO® an extremely flexible and versatile infusion pump.
Innovative Drug Infusion Technology for Laboratory Animals

Implantable

The pump can be completely implanted in small laboratory animals subcutaneously. Thus, the animal moves freely without any restraint (i.e., tethering) during drug infusion. Additionally, infection risk is reduced, and the animal is likely to be significantly less stressed than in a tethered infusion model.

Refillable

You can replenish any medical fluid in the pump via percutaneous access to the pump refill septum and reservoir after implantation of the pump. Therefore, long-term drug infusion can continue until the installed battery life has run out. The reservoir is elastic and configured in such a geometry as to allow gentle palpation to confirm an approximate level of fluid in the reservoir.

Precision

The technology driving the infusion is a patented “Rotary Finger” method. This method is a unique form of peristalsis. The precise “micro-stick” pushes a rubber tube in the pump in a uniform and sequential manner. The accuracy of iPRECIO is +/-5%.

Programmable

Using the easy to use menu driven iPRECIO software, header information along with infusion protocol details are entered and ultimately downloaded to the pump’s flash memory. Start Time, End Time, Flow-rate (1.0 L/hr to 30.0 L/hr), Constant and Variable infusion mode are programmable. Both Constant and Variable infusion options have instant or Recovery Mode infusion settings.

In Variable infusion mode, 10 flow-rate steps are user programmable. Further sophistication may be obtained by using iPRECIO’s Repeat Mode where the 10 steps are programmed within one or several repeat cycle loops (5 loops maximum). Each loop may be repeated 2-250 times. The programmable feature will make iPRECIO pumps indispensable for applications where accurate flow infusion, recovery/washout periods, constant/variable dose or complex circadian infusion studies are necessary.

Flow Rate Mode

1. Constant Flow Rate
   - Configure up to 10 discrete infusion “steps” between 1.0 L/hr to 30.0 L/hr

2. Variable Flow Rate
   - 1 Variable Flow Rate Mode
     - Configures up to 10 discrete infusion “steps” within 1.0 L/hr to 30.0 L/hr
     - Infusion Flow Rate Setting

Repeat Mode

Repeat Mode allows the 10 flow steps to be used in a more sophisticated infusion protocol where up to 2500 protocols can be programmed. The programmable feature will make iPRECIO pumps indispensable for applications where accurate flow infusion, recovery/washout periods, constant/variable dose or complex circadian infusion studies are necessary.

Flow Rate

- 1 Variable Flow Rate Mode
  - Configures up to 10 discrete infusion “steps” within 1.0 L/hr to 30.0 L/hr

- Infusion Flow Rate Setting

- 10 steps x 250 times repeated (subject to battery life)

- Repeat Mode program image

- Repeat Mode setting window

- Refillable
  - You can replenish any medical fluid in the pump via percutaneous access to the pump refill septum and reservoir after implantation of the pump. Therefore, long-term drug infusion can continue until the installed battery life has run out. The reservoir is elastic and configured in such a geometry as to allow gentle palpation to confirm an approximate level of fluid in the reservoir.

- Programmable
  - Using the easy to use menu driven iPRECIO software, header information along with infusion protocol details are entered and ultimately downloaded to the pump’s flash memory. Start Time, End Time, Flow-rate (1.0 L/hr to 30.0 L/hr), Constant and Variable infusion mode are programmable. Both Constant and Variable infusion options have instant or Recovery Mode infusion settings.

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- Data Communication (IR)
  - IR communications are used for loading the infusion program and activating the pump. It is made directly without removal from the blister pack. Therefore sterility is maintained until the pump is taken to the sterile surgical suite for filling/activation and implantation.

- GLP Compliance
  - For GLP compliance, accuracy of flow infusion can be validated. In addition, the IR communication is used for loading the protocol into the pump's flash memory.

- Long battery Life
  - The battery life is up to 6 months at a continuous flow rate of 1.0 L/hr. You can confirm the estimated battery life on the PC Screen when you set the infusion protocol with the iPRECIO Management Software.

- Research Applications
  - iPRECIO is an innovative infusion pump which is used for small lab animal infusions in many different research and application fields.
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- **Reservoir**: 900μL, Built-in Elastic Reservoir (Medical Grade SBS)
- **Tubing**
  - **Inner Tubing**: Medical Grade SBS (DEIN Series)
    - Inner Diameter: 0.57mm / 0.022in
    - Length of Inner Tube: approx. 135mm
  - **Outer Tubing**: Medical Grade SEBS (Olefin Series)
    - Outer Diameter: 1.22mm / 0.048in / 3.66Fr
    - Length of Outer Tube: approx. 135mm

- **Activation Method**
  - **Data Communication**: IR Communication
  - **Range of Flow Rate**: 1.0 μL/hr - 30.0 μL/hr (0.1 μL/hr resolution)
  - **Accuracy**: < ±5% (under 0 - 80cmH2O pressure)
  - **Battery Life**:
    - 6 Months at 1.0 μL/hr
    - 1 Week at 30.0 μL/hr
  - **Size/Weight**: 38.7 (L) x 19.2 (W) x 9.7 (H) mm / 7.9g

- **Type of Usage**: Disposable
- **Package**: EO Sterilized blister package (5pcs / box)

**Infusion Method**

1. Instant Infusion Mode
2. Post Recovery (Delayed) Infusion Mode
3. Constant Flow Rate Mode
4. Variable Flow Rate Mode (minimum - 10 flow rate steps)
5. Variable Flow Rate Mode (maximum - 10 flow rate steps)

- **Flow Rate Mode Selection**
- **Dead Volume Setting**
- **Flushing setting**
- **Schedule Management** (Exchange schedule, Refill date/time, Alarm, Elapsed time & volume infused, etc.)
- **Re-calibration of iPRECIO pump
- **Upload of Pumps' log

**iPRECIO® Data Communication Device**

- **Interface**: USB / Serial Interface
- **Communication with Pump**: IR Communication
- **Power Supply**: PC USB or AAA batteries
- **Size / Weight**: 120 (L) x 62 (W) x 35 (H) mm / 147g (with batteries)
- **Accessories**: 1 USB cable (1m), 2 AAA batteries

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