



# ESP-2000

Dual channel TCI  
Syringe pump



INFUSION LINE



# ESP-2000

Dual channel TCI Syringe pump

## Features

ESP-2000 syringe pump is an automatic dosing device that is developed by advanced computer control technology and precision machinery processing technology based on the clinical medicine experience and pharmacokinetics theory. Such product has Continuous flow rate infusion mode, Volume and Time infusion mode, Intermittent infusion mode, Bolus & Infusion mode, Plasma target controlled infusion mode and Effect Site target controlled infusion mode, which are applicable to each department for performing intravenous

- Simple to operate
- LCD color display
- History infusion data can be saved
- Abnormal flow rate alarm, assure every accurate infusion

## Functions

### - Continuous flow rate infusion mode

The infusion can be controlled by setting the infusion speed; the system maintains drug delivery at the set administration speed. There are 10 infusion speed units (ml / h, ml / min, mg / h, mg / min, µg / h, µg / min, mg / kg / h, mg / kg / min, µg / kg / h, and µg / kg / min) to choose from.

### - Volume and time infusion mode

The infusion can be controlled by setting the specified dosage and specified time to be infused. The syringe pump can automatically calculate the infusion rate, and the infusion is performed with this rate.

### - Intermittent infusion mode

The infusion can be controlled by setting the flow rate to be infused, volume to be infused per interval, intermittent time between intervals, and KVO (Keep Vein Open) infusion velocity, which is suitable for syringing sustained analgesic.

### - Plasma target controlled infusion mode

Following population pharmacokinetic - pharmacodynamic theory, by directly controlling the plasma concentration at the expected value, an anaesthetic infusion method for the control and regulation of the depth of anaesthesia is developed that can be used for intravenous infusion of anaesthetic drugs.

### - Effect Site target controlled infusion mode

Following population pharmacokinetic - pharmacodynamic theory, by directly controlling the effective site concentration to the expected value, an anaesthetic infusion method for the control and regulation of the depth of anaesthesia is developed that can be used for intravenous infusion of anaesthetic drugs.

### - Bolus and infusion (TIVAI)

To control infusion by setting unit, drug concentration (Conc), induction volume (Bolus), induction time (Bolus Tm) and maintenance rate (infusion), this infusion is simple to operate.

### - Alarming function

ESP-2000 syringe pump provides several alarming signals, including Stand-by, AC power fail, Battery low, Battery empty, No syringe, Check syringe, Syringe changed, Occlusion, Speed malfunction(stopped), Speed malfunction(fast), Speed malfunction(slow), drug Almost empty, drug Empty, and infusion completed etc.

### - Infusion record memory function

The ESP-2000 infusion system can automatically perform record keeping, and allows users to export the data to a computer at any time by running the data export software provided with the unit. See the Appendix for the export method.



# ESP-2000

Dual channel TCI Syringe pump

## Main technical specifications

Occlusion Alarming Pressure Level		<b>Low</b> (300±100)mmHg	<b>Middle</b> (500±150)mmHg	<b>High</b> (900±200)mmHg
Touch Time	1ml/h	≤ 35 min	≤ 55 min	≤ 95 min
	5ml/h	≤ 10 min	≤ 20 min	≤ 30 min
Pill Dosage (ml)		≤ 1ml	≤ 2.5ml	≤ 3.5ml

## The drugs and respond model under TCI mode

Drug name	pharmacokinetic model
Propofol	Marsh, Schnider
Remifentanil	Minto
Sufentanil	Bovill
Fentanyl	Shafer
Alfentanil	Maitre
Midazolam	Greenblatt
Etomidate	Arden



# ESP-2000

Dual channel TCI Syringe pump

## Technical parameter

Power supply	Alternating-current power supply: 100-240V, 50/60Hz Built-in battery: rechargeable, direct current 11.1V, 4400mAh Continuous use time: more than 3 hours (new battery is charged fully under 5ml/h syringe condition)
Fuse protector	∅5×20, T, 1.6A, L, 250V
Setting flow rate	5 ml syringe: 0.1 ml/h to 150 ml/h 10 ml syringe: 0.1 ml/h to 300 ml/h 20 ml syringe: 0.1 ml/h to 600 ml/h 30 ml syringe: 0.1 ml/h to 900 ml/h 50 ml syringe: 0.1 ml/h to 1200 ml/h
Tolerance of infusion volume	Infusion precision: $\pm 2.0\%$ , including mechanical precision at $\pm 1\%$ ; Precision obtained after more than two hours of infusion at $\geq 1.0$ ml/h.
BOLUS and purging rate	5ml syringe: 150ml/h 10ml syringe: 300ml/h 20ml syringe: 600ml/h 30ml syringe: 900ml/h 50ml syringe: 1200ml/h
Alarming pressure level	Performing three-level switching Low: $300 \pm 100$ mmhg Medium: $500 \pm 150$ mmhg High: $900 \pm 200$ mmhg
Data memory function	Preserving the stored record for more than 5 years under a condition that the power is not connected.
Maximum error infusion volume after the syringe pump has failure suddenly	$\leq 4$ ml
Operating conditions	a)ambient temperature: $5^{\circ}\text{C} \sim +40^{\circ}\text{C}$ b)relative humidity: $\leq 90\%$ ; c)atmospheric pressure: $700\text{hPa} \sim 1060\text{hPa}$
Transport and storage conditions	a)ambient temperature: $-20^{\circ}\text{C} \sim +55^{\circ}\text{C}$ b)relative humidity: $10\% \sim 93\%$ ; c)atmospheric pressure: $500\text{hPa} \sim 1060\text{hPa}$



ESSE3 srl, Via Garibaldi 30  
14022 Castelnuovo D.B. (AT)  
Tel +39 011 99 27 706  
Fax +39 011 99 27 506  
e-mail [esse3@chierinet.it](mailto:esse3@chierinet.it)  
web: [www.esse3.dreamgest.com](http://www.esse3.dreamgest.com)

