Making Life Easier – Easypump® II

The elastomeric pump system for short- and long-term infusion therapy
Indications
Elastomeric pump devices are intended to infuse medication for either continuous intravenous, or subcutaneous infusion (according to pump model). Chemotherapy, antibiotics, anaesthesia and IV pain management are the most common therapies where elastomeric pumps can be used, either in adult or pediatric patients.

Contraindications
Elastomeric pumps are contraindicated for the delivery of blood, blood products, insulin, total parenteral nutrition, or lipid emulsions.

Easypump® II
Disposable Elastomeric Infusion Pump System

Easypump® II elastomeric infusion pump is designed to give clinicians and nurses the option of delivering pre-determined amounts of medication to the patient in a continuous and accurate manner, either at the hospital, ambulatory settings or at home.

Easypump® II is independent of main power supply or batteries, enabling the patient to be treated in an ambulatory manner.

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Easypump® II LT 120–30–S

120 indicates the nominal fill volume in ml. Easypump is available from 50 to 500 ml in the following volumes:

LT: 60-65-80-100-120-125-270-300-400 ml
ST: 50-100-250-400-500 ml

S stands for “soft shell” e.g. a soft and flexible housing and body of the pump.

The new generation: Easypump® II ST/LT
Easypump® II ST/LT is the first choice for healthcare workers and patients requesting a
• mobile
• safe
• cost effective
• easy to maintain and implement solution for the delivery of short- and long-term IV therapies.

Easypump® II offers a broad product portfolio of different versions. A clear coding system gives you guidance to identify the version that fits best to your customer needs.

30 stands for the nominal infusion time in hours.
The following durations are the standard options:
ST: 0,5-1-1,5-2-4 hours

LT stands for “long-term” and stands for an infusion time between 12 hours and 270 hours (11 days).

ST stands for “short-term” and represents the range of pumps with an infusion time from 30 minutes to a maximum of 4 hours.
Components of Easypump® II

Working Principle of Easypump® II
Medication is delivered to the patient by positive pressure applied by the elastomeric membrane. The flow rate is determined by the combination of the flow regulation device (flow restrictor) and the positive pressure of the elastomeric membrane.

This pressure delivers the solution against the back-pressure of catheters and blood pressure in the veins.

Materials
The materials of the elastomeric pumps that constitute the fluid path are: MVQ, PVC, PMMA, PC, PSU, ABS, CA, borosilicate glass, PTFE.

Compliance
Easypump® II elastomeric pumps are manufactured under a certified quality system according to ISO 13485. ISO 28620: 2010 (E), particular requirements for the safety of infusion pumps and controllers.

Silicone membrane with improved functionality
- Even inflation of the balloon
- Better mechanical stability
- More constant flow rate
- Better appearance
- Transparent
- 5-year shelf life

Elastomeric membrane
The inner elastomeric membrane made of silicone is the fluid reservoir containing the medication and works as the pressure source.

Over- and Underfilling:
The type of drug (e.g. toxicity) often requires a flow rate dosage calculation made in terms of body weight or surface area, which may lead to an infusion volume which does not exist in a standard pump. Such therapy requirements may indicate the use of a Easypump® with a non-standard volume. Easypump® II is very solid and tolerates over- and under-filling above or below the nominal filling volume. There is a wide range of fluid volumes where Easypump® remains within the flow rate accuracy. In order to ensure maximum accuracy within product specification we recommend filling within this range. Please refer to the Over- and Underfilling Table (also included in the IFU).

Retained Volume:
Accuracy and quality are also influenced by the fluid volume that remains inside the pump at the end of infusion. Maximum retained volume, also called dead space or priming volume, is the fluid volume that remains inside the Easypump® II (inner cylinder, cap, tubing, filter etc) when the pressure of the elastomeric membrane is gone. This volume is very small and ranges from ≤ 2 ml up to ≤ 10 ml depending on the size of the pump (please refer to the IFU for exact data per pump).
Temperature

Easypump® II is designed to work at room temperature 23°C ± 2°C (73°F ± 3.6°F). The flow restrictor is calibrated to work at 31°C (88°F). To maintain a stable flow rate the flow restrictor should be in close contact with the patient’s skin at all times (31°C). For every 1°C above or below this temperature, the flow rate will increase or decrease by approximately 2.5%. An increase in temperature results in an increase in flow rate and vice versa. Easypump® II may be refrigerated but should not be stored in a freezer prior to use. Before using Easypump® II it should be warmed to room temperature.

Influencing factors may affect the flow rate

Ambient pressure

Easypump® II should be used within an ambient pressure between 86 kPa and 106 kPa.

Diluent viscosity

Easypump® II flow rates are calculated on basis of using 0.9% NaCl. Using D5W (5% dextrose in water) as diluent or the addition of any drug of a higher viscosity than normal saline will increase delivery time (e.g. by 10% in case of DSW).

In case of a fever, the actual infusion rate may be a little higher than the nominal rate – therefore, the user should respect the patient’s temperature when making a clinical decision.

When filled to nominal volume, the flow accuracy is ±15% of the labeled flow rate for Easypump® II.

Innovations of Easypump® II and benefits for the users

Elastomeric Membrane

Reduced Filling pressure

Easypump® II has a silicone layer that stretches easier than the previous latex layer. As a consequence the filling force is reduced by approximately 50% in comparison to other elastomeric pumps.

Air eliminating membrane

Due to the higher permeability to gases, the membrane allows a faster exit of air bubbles occurring inside the reservoir.

Improved design

The high transparency of the membrane allows better visual inspection of the containing fluid.

Sliding Core®

Movable/telescopic inner core allows axial expansion during filling (and vice versa contracting during deflation when delivery is running). This new and patented construction leads to:

1. Consistent fluid delivery / higher flow rate accuracy – Prevention of overdose especially for the delivery of toxic medication or when a narrow therapeutic dose is required.
2. Instant application – no waiting period is necessary to relax the pressure exerted by the bladder on the fluid inside.

Filling Port

Needle free filling

Filling of Easypump® II is done with a Luer Lock syringe, usually 50 ml, to avoid all kind of leakage during the filling process. Pharmacy filling machines can be used with Easypump® II as well.

Integrated Back-Check-Valve

Avoids any reflux of fluids and chemical contamination.

Filling port Cap: Discofix®

The cap lowers the touch contamination risk after initial unscrewing of the cap (realized by recessed cone in Luer Lock cap), as well as better tactile design and improved closing properties of the filling port to facilitate proper closing of Luer Lock filling port.

Administration line

Triangle Tubing

Much higher kink resistant tubing due to the triangle diameter design.

Air-Eliminating- and Particle Filter (1.2 μm)

The filter also eliminates particles, which may come from incomplete preparation of drugs.

FLOW RATE ml/h

FLOW RATE ml/h +10 %

Flow Duration

When filled to nominal volume, the flow accuracy is ±15% of the labeled flow rate for Easypump® II.