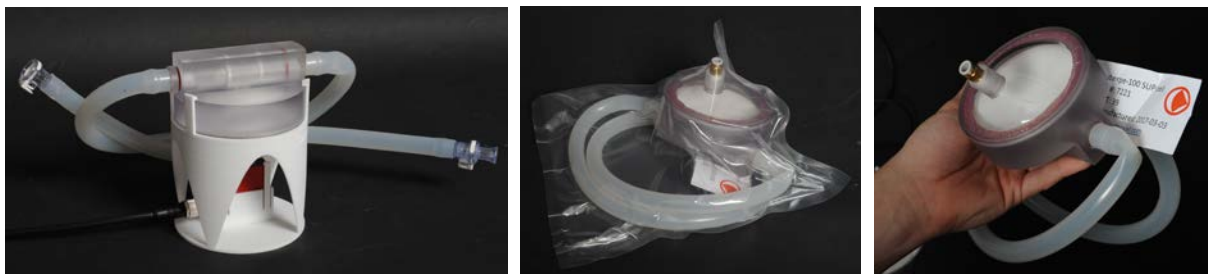


## Euterpe – world premiere

Super compact true PD diaphragm Single-Use-Pump (SUP) offer a range of unique features unheard of in the industry. For even more compact installation the stand-alone pump cell and the Lachesis control unit are separated. Of course, the pump cells are all single-use, durable and of low cost.



The disposable wetted pump cell part consists of a housing integrating a valve body, with a dome, inclosing the diaphragm. Outside the fluid conveying hoses supplied pre-sterilized in dual film bags.



The re-usable non-wetted desktop body support the laser sensors and support the SUP.

Euterpe Positive Displacement (PD) diaphragm pump control unit (Lachesis) display at any time actual mass-flow on the display. NO mass-flow sensor is needed! One or two individual operating Single-Use-Pump cells is fully programable with precisely measured mass-flow ranging 0-100% of capacity. Euterpe is self priming and pump any mix of gas and liquid. No tools are required for exchange of pump cell - takes a few seconds. The all plastic pump cell is supporting on a re-usable plastic desktop house facilitating the laser sensor. Lifetime exceeding 1 million cycles at 75% CO.

| Stand-alone product, variant names  | Euterpe-30 | Euterpe-100 | Euterpe-200 | Euterpe-300 |
|---|------------|-------------|-------------|-------------|
| Layout, number of diaphragms  | single     | single      | single      | single      |
| Diaphragm diameter, mm  | 62         | 80          | 100         | 123         |
| Diaphragm stroke, mm  | 25         | 39          | 41          | 43          |
| Stroke Volume, SV, mL/stroke  | 1-34       | 1-104       | 2-200       | 3-300       |
| Cardiac Output, CO range, mL/min  | 1-750      | 2-1.500     | 3-3.000     | 4-4.000     |
| Beats-per-Minute, BpM   | 0-22       | 0-15        | 0-15        | 0-13        |
| Typical hose connection, ID/OD mm   | 4/8        | 8/12        | 12/18       | 12/18       |
| Pump capacity = CO = Cardiac Output = (CO = BpM x SV). Euterpe CO max variation = 1:1.000 |            |             |             |             |



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#### **Physical feature**

- No expensive housing materials for traditional steam cleaning requirements
- No mechanical or liquid axle seals
- No mechanical rotating parts such as electrical motor, coupling, rollers or gearing
- No moving ball valves, but simple cross slit valves
- All simple single-use plastic parts supplied irradiated – contamination not possible
- Very low weight and compact design gives OEM manufactures freedom to design equipment
- Measures accurately pumped volume, a true Positive Displacement pump – no in-line flow-sensor is needed
- All pumps offer infinite turn-down, turn-up scale better than 1:1000

#### **Operating features**

- Max volume per stroke depending on pump size, no minimum volume exist
- Zero spallation / shedding of membrane materials as no shear is introduced
- Self-priming and able to run dry for extended periods with any controlled pulse
- Self-emptying, drain on inlet and purge on outlet as the pump will convey gas as well
- Single-use, disposable wetted parts eliminate cleaning issues – just un-pack and exchange without any tools needed
- Very gently operation with no rotating as no shear is introduced between used polymeric materials parts applying shear stresses to the pumped product
- Working pressure as much as 5 Bar makes the pump suitable for connection with filtration devices
- Pumps any fluid, gas, mixture of liquid and gases
- Two or more independent pumps able to operate fully controlled in parallel

#### **Programming features**

- Choose one pulse/stroke per day or one pulse per second or any set of pulses in between
- Choose any stroke time length
- Choose any fraction of a pulse again and again
- Any imaginable operation sequence, cycle for each diaphragm (pulse ramp, pulse train, pulse length, pulse pause, stroke start, stroke length, stroke distance)
- Fully electronically controlled
- Choose the fluid pressure you want to create – 5-6 Bar (depending on supply air pressure)
- Choose the volume you want to pump – (well, according to pump size)
- Real-time information about pumped volume from each individually diaphragm
- Data logging, data acquisition
- Pump operation based selectively on constant pressure, constant mass flow, desired volume

#### **Maintenance features**

- No tools needed for pump cell exchange
- No lubrication needed
- No need for strip down pump for cleaning
- Longevity - diaphragm tested to last +3 month at full stroke length and pulse speed

#### **Installation features**

- Single-Use-Pump parts may be part of an all sterile process package
- No tooling needed for Single-Use-Pump cell part replacement

#### **Data Collection features of Lachesis**

- On-line operation pressure from build-in pressure and displacement sensors
- On-line Mass-Flow-Control / metering, the pump measures the volume pumped accurately without external flow sensors

#### **Communication features of Lachesis**

- Re-usable pump control unit Lachesis requires only pressurized air, vacuum and 24 VDC electrical power
- TCP/IP bus connection or Wi-Fi connection
- All Euterpe kids are stand alone and share the same Lachesis communication module
- Software upgradable via the Internet

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