



What do you get with the Start-up kit MINIFOR?



- First of all you get a completely new, highly innovative fermentation/cell culture system, which has been optimised to obtain an **easy sterility and high quality of culture control**. MINIFOR is the **most compact** system on the market. It is also the only one allowing working with so little as **35 ml** of medium. Several vessels, the largest being 5 l, cover the whole spectrum of culture volumes normally used in laboratory. (Since no head plates are used, it is not expensive to switch to vessels of different volumes).
- The new stirring system **completely eliminates contaminations** coming frequently from mechanical or lip seal systems. Our system is an equivalent of a much more expensive magnetic coupling, which separates completely the outside of the bioreactor from the inside. All o-rings have been replaced by multisealing stoppers, which are quasi permanent.
- The new **radiation heating** system eliminates drawbacks of other systems. It is a **soft sun like heating**, which eliminates overheating at any working volume. It provides natural convection, eliminates the need of jacketed vessels, cables and spares space. Due to the extremely low heat capacity of the radiator the temperature control is fast and precise.
- You get the control unit with high quality measurement and control of **six parameters** -temperature, pH, pO₂, air flow rate, stirring and one additional selectable parameter according to clients need (it can be optical density, weight, concentration of substrates or any other parameter measured by an appropriate instrument with standard signal output).

Resolutely oriented toward the high quality we do not supply cheap capillary flow meters with floating ball, because their measurement varies with the pressure, temperature and is not precise. It cannot be electronically controlled and does not provide any recordable signal. Therefore we supply only an expensive but reliable high quality **mass flow** measurement system already in the start up version. The continuous airflow is regulated by a **proportional valve**. This is also expensive but allows regulating the dissolved oxygen by the amount of the air and not just by variation of the stirring speed. The majority of competing products try to control DO by variation of stirrer rotation. This is cheap for producers but limits severely the practical use of the bioreactor. Our system allows the **precise control of DO under any stirring condition**.

All measured, set up and alarm values together with pump activity are displayed on a large front display just at **one glance**. No need to scroll. Electrode signals are automatically temperature compensated. The regulation is entirely processor controlled. There is **no need** to adjust regulator PID constants any more.

- Included is combined pH/temperature probe. The Pt 100 temperature sensor is placed in **mechanically reinforced** tip of the glass electrode. This is important for fast response. The new Variopin connector can be sterilized without any protection cap.
- Included is also a **new pO₂ probe with large cathode**. The body is made entirely of PEEK – a new high performance material similar to Teflon but with much higher mechanical stability. The **glass supported Teflon** membrane is protected on the entire surface with exception of the place of cathode. This probe gives strong signal and very fast response.
- Delivered are two **high quality regulated** peristaltic pumps. Their speed can be adjusted in the ratio 1:1000. Our controllers use the whole speed range during the regulation process. In the case of large deviation of the actual value of the parameter compared to the preset one, the pump works at maximal speed and the speed diminishes progressively until both values become identical. This kind of “soft landing” is not obtainable by using cheap fix speed pumps, which are switched on and off. Since pumps are not bound to the fermentor case, they can be used for other work when they are not needed for fermentation. Lambda pumps are **the smallest** on the market. The



valuable space around fermenter is spared and the work with them is comfortable. They have been developed especially for continuous cultures and give stable flow rates with low cost tubing during weeks. They are very economic in use. **For cell cultures pumps are usually replaced by MASSFLOW gas flow regulators.**

- In addition there is a lot of material listed further in the Start-up kit description joint. Shortly there is **everything needed for a high quality fermentation/cell culture run.**

Compared to competitors, Lambda decided for a wrong marketing strategy. We supply the complete and high quality equipment with components, which are proposed by other suppliers as expensive option. (The disadvantage is that additional "boxes" accumulate aside fermentor and the total sum of money is much higher at the end). We think that it is **better for the client** to get a good equipment right a way. It spares costs, space and is more correct. Wenn comparing prices keep in mind the quality and ask for high quality equipment with features comparable to ours. Then you will see how attractive price we are offering.