2 Liter Bench-Top Fermenter

Order #
F0102

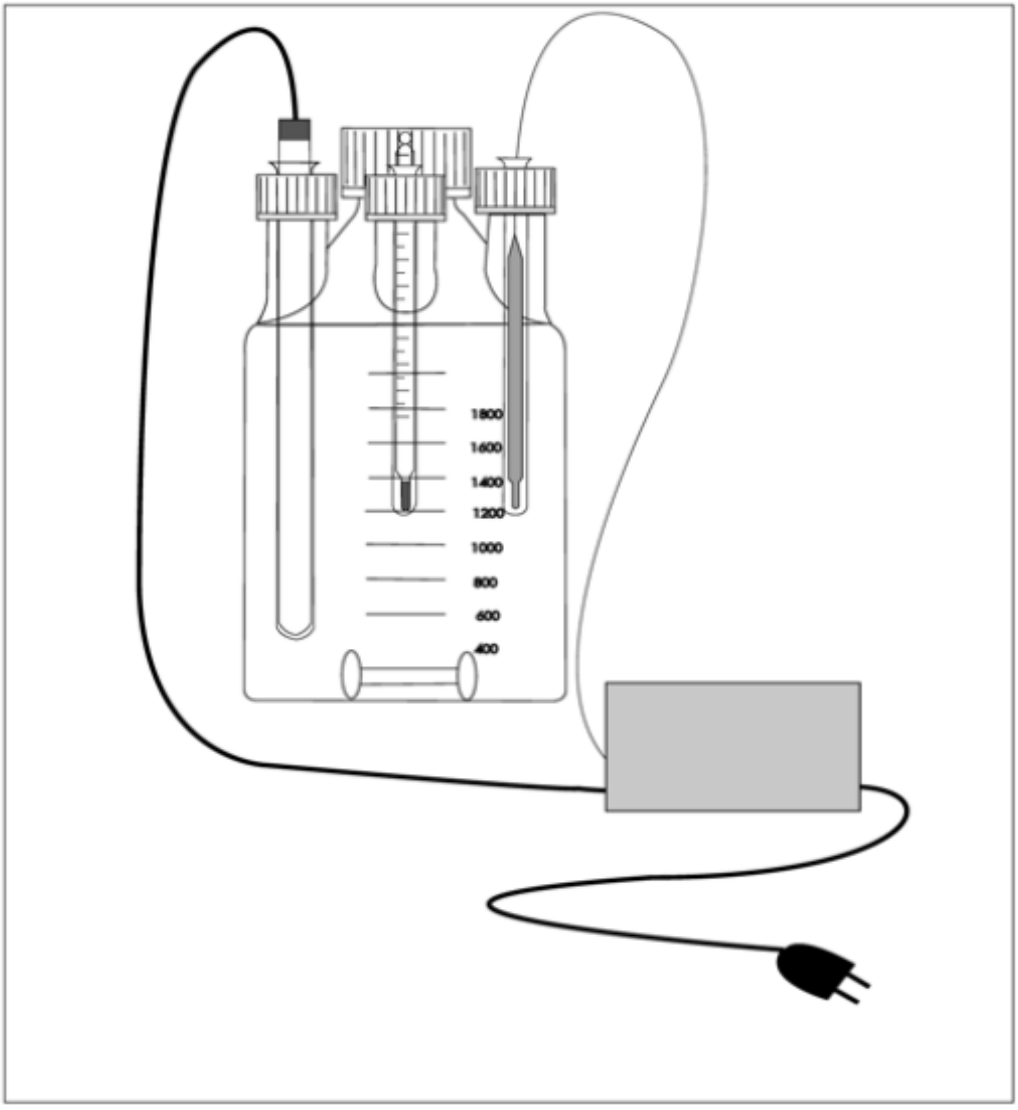
Mo Bi Tec
MOLECULAR BIOTECHNOLOGY

Content

1. Introduction

Our fermenter unit is designed for easy bench-top handling. It is simple to use and combines practical aspects with low costs. The fermenter unit has a capacity of 1 to 2 litres.

Heating is provided by a strong (100 W) heating element controlled by a calibrated relay connected to a high-quality platinum thermocouple. This allows precise temperature regulation (± 0.5 °C). A variable control pump delivers air to the bubbler. For special gas mixtures, connections to cylinders are also possible. Each unit has a series of ports. Every port is sealed by a heavy duty screw top and a silicone washer. The units contain 2 air filters (one for inflow complete with silicone tubing, one for outflow) and a thermometer for direct temperature measurement. A large magnetic stirrer bar is included as well as long (10 cm) needles for taking samples through septa. The unit fits into even the smallest of upright autoclaves. The fermenter is delivered completely. All replacement parts are available separately.

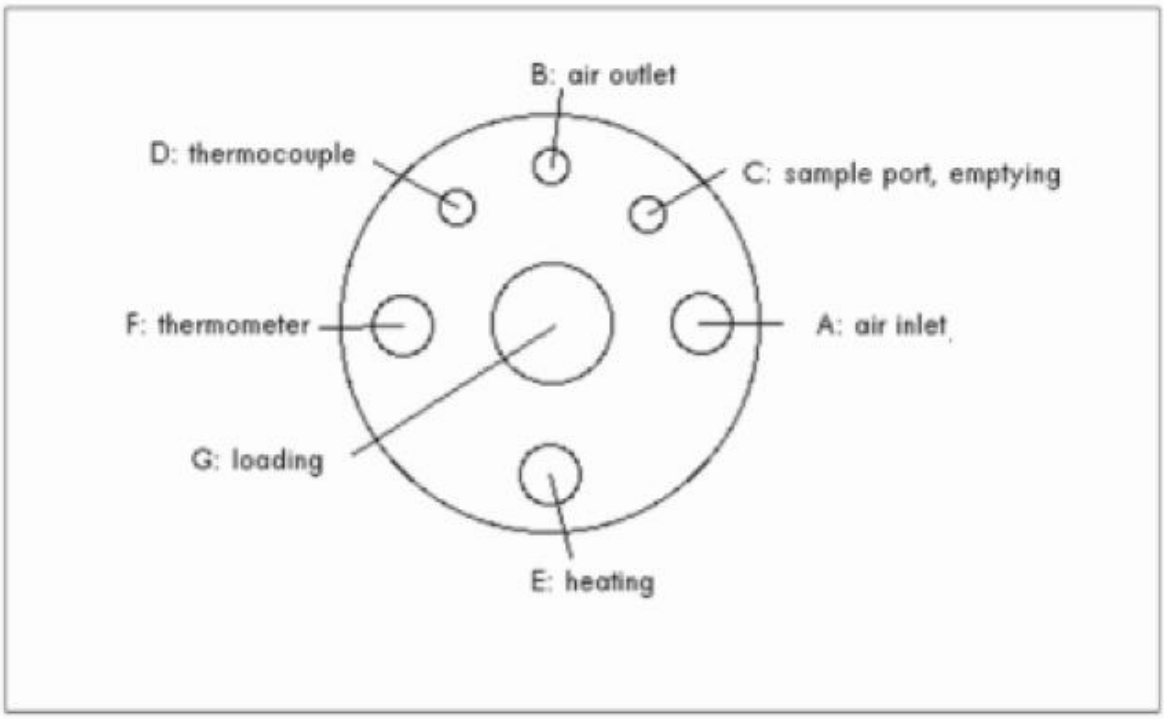


The 2 l Fermenter

2. Directions for Use

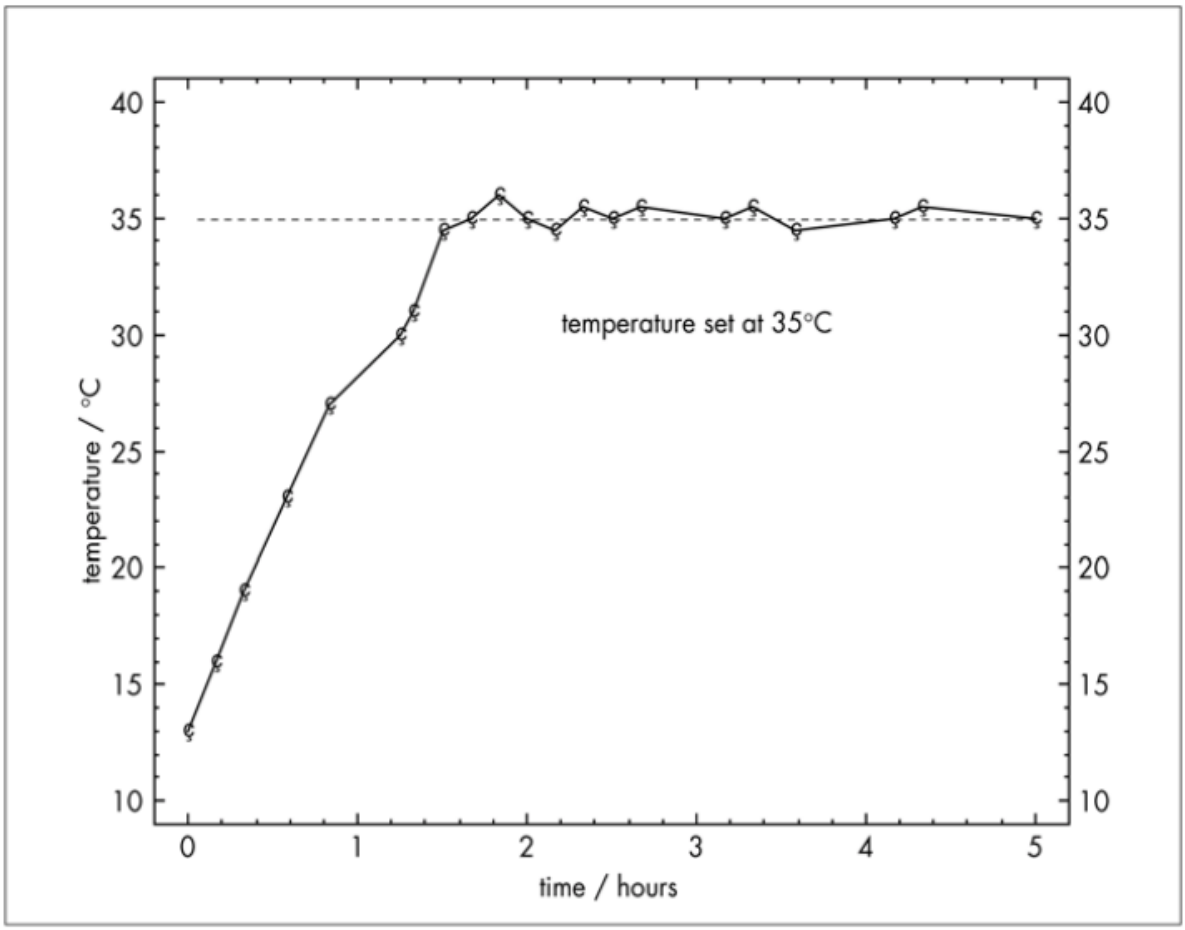
Fill the air filters with cotton wool. Mount the bubbler (this can also be autoclaved separately, with filter) in port B. The outlet filter is fitted in port A and port C closed with a septum. Insert the three test tubes into ports D, E and F. Port G can be used for your pH-meter electrode, if desired. Fill the fermenter with medium through port G. Also add 1 to 2 drops antifoam (e.g. Sigma #A-5551 antifoam 289). If needed, the pre-weighed powder can be introduced by port G and water poured into the appropriate extent (volume graduations on the fermenter body). Close port G. The unit is then ready to be autoclaved.

Important: *The silicone washers must lie flat under the screw taps, otherwise leaks and damage to the glass screw may occur.*



When sterile, insert the thermometer into the test tube in port F and the thermocouple into port D (it must touch the bottom of the test tube). Insert the heating element into port E. Unscrew the waterproof lid of the relay unit and set the dial to the working temperature. Plug-in the relay. Switch on the green „on“ switch (this will light up) and pre-incubate until the desired temperature is reached, adjust the dial if necessary. Screw the top back onto the relay. If the bubbler was autoclaved separately, then insert it into port B. Connect the tubing to the air pump and plug this in. The pump can be regulated by turning the white knob close to the air outlet. Place the fermenter on a magnetic stirrer, switch it on and adjust it to the desired stirring rate. The starter culture (and non autoclavable media components, e.g. vitamins, antibiotica etc.) are introduced through port C as follows: Wet the septum with 70% ethanol and introduce the culture with hypodermic syringe and needle. This process can be repeated throughout the incubation to take samples, using the extra-long needles provided. When the desired state of growth has been reached, remove all external elements from the fermenter (heater, thermocouple, thermometer etc.) and unplug the relay and pump. Unscrew port C and pour out the cells. Starting from cold, a temperature overshoot of about 1 °C is normal. The temperature control unit will keep the temperature (between 40 °C and room temperature) with an accuracy of about

± 0.5 °C. For increased sensitivity, pour clean water into tubes D and F (thermocouple and thermometer).

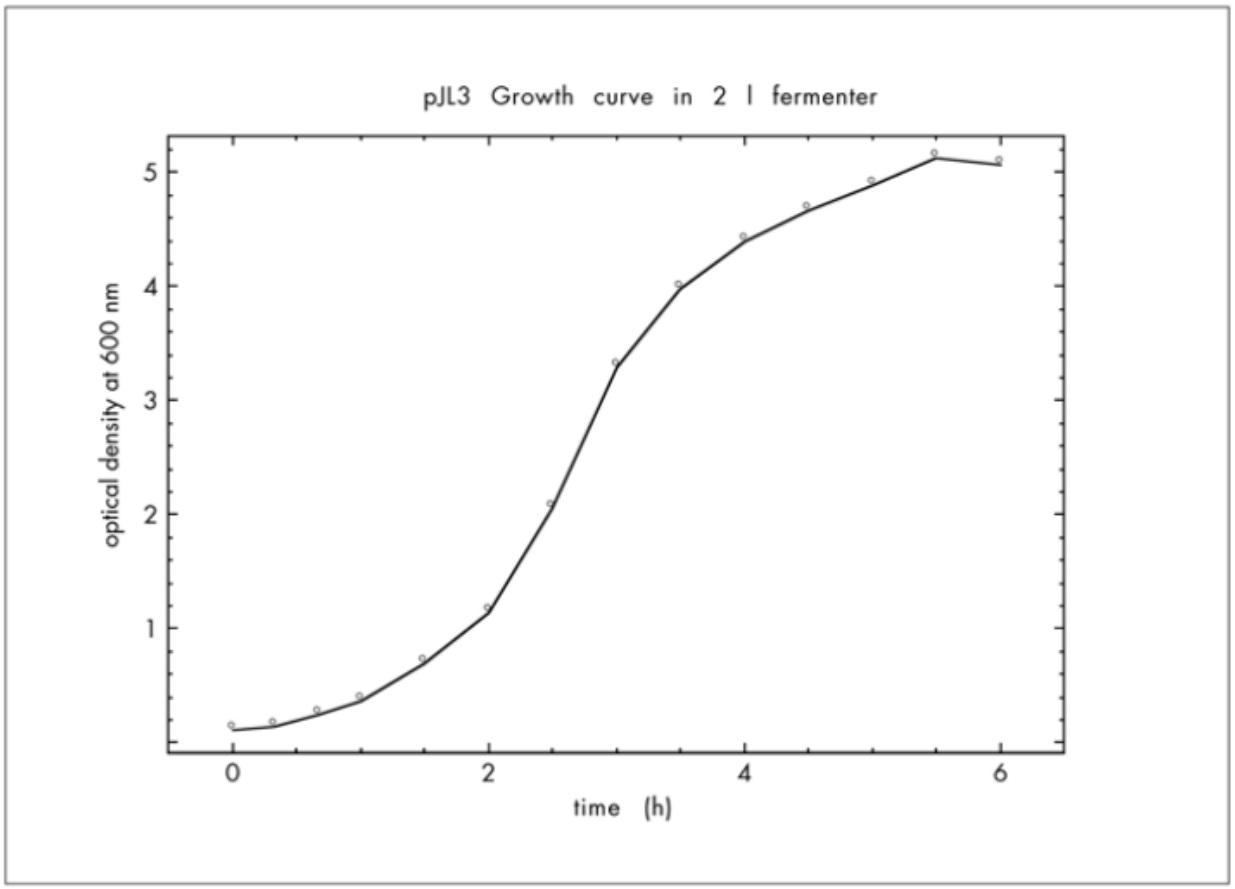


Temperature curve of the medium within the fermenter

3. Cleaning

Use a mild detergent in warm water. For deposits in the fermenter body (for example from filamentous cyanobacteria, etc.) we suggest soaking in 3 M HCl. Rinse well with distilled water.

4. Growth Curve



Growth (OD_{600}) of *E. coli* (N3406; pJL3) cells in YT medium (with chloramphenicol) including antifoam at 37 °C. Two litre fermenter with 20 ml starter culture. Samples measured at appropriate dilutions.

5. Content "Fermenter Complete System"

2l	fermenter body	
1	relay unit (0 - 40 °C) containing Pt thermocouple and heating element	
1	air pump	
1 m	silicon-tubing (6 x 9 mm)	
10	long needles	
1	bubbler (Ø 10 mm)	
1	air outlet	
1	glass capillary (od: 8.2 mm id: 2 mm)	
2	air sterile filters (hydrophobe)	
1	thermometer (50 °C alc)	
1	magnetic bar (55 mm)	
1	screw cap	GL 45
3	screw caps	GL 25 (in. ø 16 mm)
3	screw caps	GL 18 (in. ø 11 mm)
2	tubing clamps	

		outer diameter mm	**inner diameter mm**	**length mm**
1	glass tube	14	12	ca. 200
1	glass tube	10	8	ca. 200
1	glass tube	9	7	ca. 200
1	septum	42		
2	septa	22		
2	septa	17		
1	washer	22	13	
1	washer	22	10	
1	washer	22	8	
3	washers	17	8	

6 Order Information Shipping and Storage

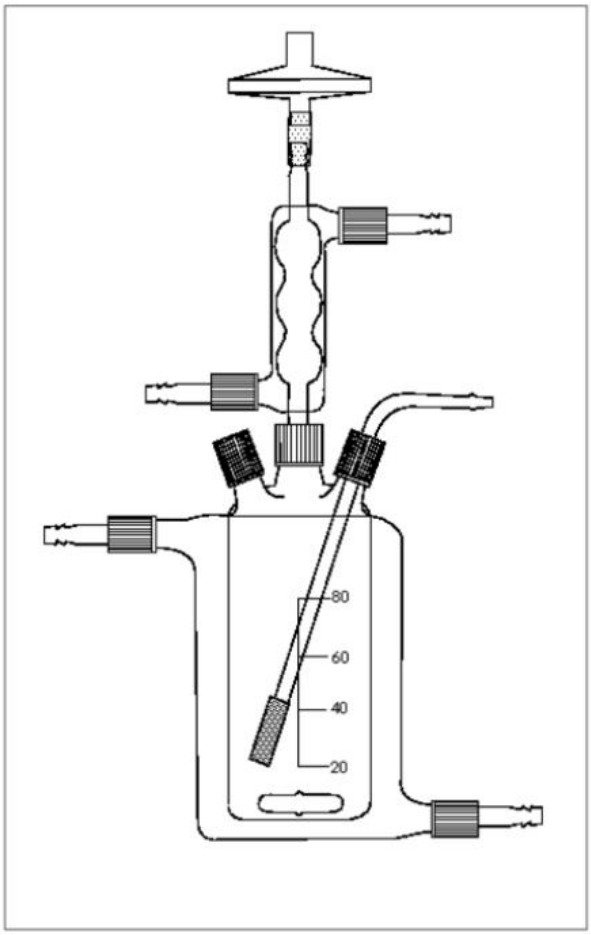
Order#	Product	Quantity
F0102	2 liter Fermenter complete	1
shipped at RT; store at RT		

Replacement parts:

Order#	Product	Quantity
F0201	Replacement Kit Heating: Relay Unit, Heating Element, Pt thermocouple, plug and cable	Kit
F0202	Replacement Kit Accessories: 1 m tubing, 1 magnetic bar, 10 long needles, 11 assorted washers/spta, 2 filter units	Kit
F0203	Fermenter replacement Kit : 2 L fermenter body, 1 thermometer, 3 glass tubes, screw caps, bubbler, washers and septa, air outlet, glass capillary	Kit
F0204	Replacement Kit Pump: Air Pump	Kit
F0206	Replacement Kit: tubes and washers	Kit
shipped at RT; store at RT		

Also available at MoBiTec:

The 100 ml Fermenter



Please contact us for further information.

Note:

MoBiTec has improved the 2 l fermenter system:

1. Filter

The glass filters (to be filled with cotton) are replaced by air sterile filters.

materials	membrane:	PTFE
	assembly:	PP
filtration area	16 cm^2	
micron rating	0,2 µm	
air flow rate	16 l/min; 200 mbar Dp	
sterilisation	autoclavable up to 121 °C	

2. Taking samles

For taking samples you can use the delivered glass capillary. It prevents destruction of the cells. Place the capillary in port C before autoclaving. Put a short piece of tubing at the end and close it with a tubing clamp. For taking samples, open the capillary and close the air outlet for a few seconds. The air pressure will transport the cell suspension into the capillary.

7 Contact and Support

MoBiTec GmbH ◆ Lotzestrasse 22a ◆ D-37083 Goettingen ◆ Germany

Customer Service – General inquiries & orders
phone: +49 (0)551 707 22 0
fax: +49 (0)551 707 22 22
e-mail: order@mobitec.com

Technical Service – Product information
phone: +49 (0)551 707 22 70
fax: +49 (0)551 707 22 77
e-mail: info@mobitec.com

MoBiTec in your area: Find your local distributor at www.mobitec.com