

BTP-steril

modular Bioreactor plant



Bioreactor sterile – basis unit



Bioreactor sterile – basis unit, consisting of:

- Connection options for two bio reactors (UIT)
- Control unit with Panel PC – 15.6" true-flat WXGA TFT LCD with projected capacitive touch control; IP65-rated front panel
- Control software (Windows 10)
- Integrated control unit for tube pumps – pH-control is part of standard equipment
- Both reactors can be controlled individually
- USB-Interface for data transfer
- LAN-Interface
- Input for three gases – suitable for tube diameter 6 mm
- Power supply 110-230 VAC with emergency switch off
- Stainless steel housing
- Dimensions: 700 x 550 x 690 mm

Pumps



- For every reactor a maximum of 5 pumps heads (SP4-S-UPPH 5061) can be installed – 10 pieces in total
- Pump head suitable for several tube sizes (0,13 x 0,9 mm; 0,25 x 0,9 mm; 0,51 x 0,9 mm; 0,76 x 0,85 mm; 1,02 x 0,85 mm; 1,52 x 0,85 mm; 1,85 x 0,85 mm; 2,06 x 0,85 mm; 2,54 x 0,85 mm; 2,79 x 0,85 mm)
- Flow rate 0,00014...41,52 ml/min with several tube sizes



- For every reactor a maximum of 3 pumps heads (SP4-P-UPPH 103) can be installed – 6 Pieces in total (pump head combinations on request)
- Pump head suitable for tube sizes (inner diameter x thickness) 0,8 x 1,6 mm; 1,6 x 1,6 mm; 2,4 x 1,6 mm; 3,2 x 1,6 mm; 4,8 x 1,6 mm; 16,4 x 1,6 mm; 8 x 1,6 mm
- Flow rate min 0,00633...367 ml/min with several tube sizes



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Interfaces/ Control functionality



Interface for two **mixer units** incl. speed control

Aeration

- Inputs for 3 gases incl. hand pressure regulator valve with manometer
- Manometer input pressure of gases

Measuring equipment

- Mounted pH-amplifier incl. temperature measurement – incl. socket for connection of pH-probe
- Preinstalled connection (socket) for an LDO sensor
- Other parameters on request

Heating control unit for electrical heating mat

- Two sockets for heating mat
- Possibility to define target temperature of the bioreactor medium and maximum temperature of the heating mat

Control unit - SENSOcontrol



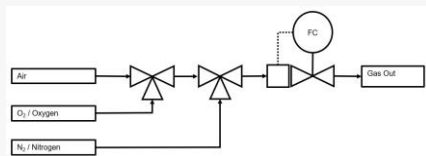
Control Functions:

- Control of mixer units – speed and asynchronous use
- pH-control – control of tube pumps
- Aeration control
- Feeding system – control of tube pumps
- Temperature control of reactors

Display and Storage:

- Process diagram of the current system incl. display of the current measured values
- Tabular display of the current measured values
- Graphical presentation of the main parameters
- Storage of the measured values

Aeration



- Inputs for 3 gases incl. hand pressure regulator valve with manometer
- 3 magnet switching valves for definition of gas mixing ratio
- One MFC (Mass Flow Controller)
range 1: (0).0,04...2 Nm³/h Air/ range 2: (0).0,038...1,9 Nm³/h O₂;
range 3: (0).0,04...2 Nm³/h N₂; range 4: (0).0,032...1,6 Nm³/h CO₂
- Additional MFC on request

Bio reactors - bioreactor with mixer unit



- **Version1:** Double walled glass reactor – jacketed
- **Version 2:** Glass reactor – unjacketed
- Borosilicate Glass/ reactors usable up to 60°C
- Glass reactors with stainless steel parts - autoclavable
- Lid made in stainless steel 316L
- Gas-tight shaft feedthrough with simmering's
- Mixer unit range up to 0...1000 rpm; 200 W;
at maximum torque 200 Ncm
- Mixer tool – Rushton impeller
- incl. baffle assembly
- incl. air aeration tube with porous sparger
- Exhaust gas cooler
- Sterile filter
- Rack for the whole system

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Reactor types	
Reactor sizes - jacked	<ul style="list-style-type: none"> - Size 1: Volume 5l; vessel I.D. 150 mm/ height approx. 365 mm - Size 2: Volume 8l; vessel I.D. 200 mm/ height approx. 335 mm - Size 3: Volume 10l; vessel I.D. 200 mm/ height approx. 400 mm - Other sizes on request
Reactor sizes - unjacked	<ul style="list-style-type: none"> - Size 1: Volume 5l; vessel I.D. 150 mm/ height approx. 330 mm - Size 2: Volume 8l; vessel I.D. 200 mm/ height approx. 300 mm - Size 3: Volume 10l; vessel I.D. 200 mm/ height approx. 360 mm - Other sizes on request
Sensors	
Dissolved Oxygen [O ₂]	Range 0 ... 25 mg/l O ₂ / 0-300 % saturation – LDO sensor
pH-value	Range 0... 14, resolution ΔpH = 0,01, combination electrode; thermally stable up to 130°C; Gel electrolyte
Redox	Range –1000 ... +1000 mV, Resolution 1 mV
Conductivity	on request
Sensor length	120/225/325/ mm
Detailed technical data's see separate data sheets	
Temperature control	
Thermostat/ Refrigerated circulator	<p>Common Specifications</p> <ul style="list-style-type: none"> - Volume 7 l/ Incl. circulator mounted in the basin - Incl. one Temperature sensor for mounting in the bioreactor - Display 3,75" Touch-Pad LCD - Power supply 230 VAC (other on request) - Maximum ambient temperature: 35 °C
	<p>Heating - temperature control (heating) via water using a thermostat heating system with pump technology - max. target temperature 60°C</p> <p>Thermostat controlled by central control unit Internal Pump 16,7 l/min at max Pump rate variable – controlled via thermostat Maximum pressure 0,25 bar Heater: 2200 W Maximum ambient temperature: 35 °C</p>
	<p>Heating/ Cooling – temperature control (heating/cooling) via water using</p> <p>Refrigerated circulator controlled by central control unit Heater: 2200 W Cooling capacity @ 20°C 200 W Internal Pump 16,7 l/min at max Pump rate variable – controlled via thermostat Maximum pressure 0,25 bar</p>
Heating mat	<p>Heating by electric heating mat - max. target temperature 60°C Possibility of defining the heating mat temperature; measurement of the substrate temperature and realisation of a control system</p> <p>Size of heating mat depends on the reactor size</p>
	

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Equipping status

The scope of equipment is defined with the offer. The data sheet contains optional equipment features

Subject to change in the interest of technical progress!