

BioEquipment

Bioreactors and Fermenters  
 Airlift Fermenter  
 Airlift Visual Safety Fermenter VSF  
 Anaerobic Fermenter  
 Autoclavable Fluidized Bed Reactor AWS  
 Autoclavable Laboratory Fermenter ALF  
 Cell Fermenter  
 Enzyme Membrane Reactor EMR  
 Fermenter with Integrated Downstreaming  
 Fermenter for Plant Cell Cultivation  
 Fluidized Bed Reactor WS  
 High Pressure Fermenter  
 High-Temperature-High-Pressure Fermenter HTE  
 Laboratory Fermenter L1523  
 Laboratory Fermenter NLF22  
 Laboratory Pilot Fermenter LP351  
 Loop Safety Fermenter LSF  
 Membrane Reactor MF  
 NMR Reactor  
 Photoreactor  
**Pilot Fermenter P**  
 Rotaschon Fermenter  
 Small Laboratory Fermenter KLF  
 Solid State Fermenter  
 Surface Cultivation Reactor  
 Visual Safety Fermenter VSF

Up- and Downstream Equipment  
 Cold Sterilization  
 Continuous Sterilization System  
 Dispersing Mixer  
 Dosage System  
 Medium Storage Vessel 50-5000 l  
 Perfusion System  
 Spiral Filter  
 Feed Vessel  
 Probes/Measuring systems  
 Admittance Probe  
 Antifoam Probe  
 Exhaust Gas Analyzer  
 Gas Flow Meter  
 Intelligent Front Module IFM  
 Level Indicator «Biowatch»  
 Level Measurement Probe  
 pH/Redox Probe  
 pH Interchangeable Probe  
 pO2 probe  
 pO2 Interchangeable Probe  
 Pressure Transmitter  
 Pt100 Temperature Probe  
 Software for Media Optimization  
 Turbidity Probe  
 Weighing Probe  
 Weight Measurement: Platform, Cell

Sampling and Harvesting  
 Contained Sampling System  
 Dialysis Probe  
 Harvesting Valve  
 Pervaporation Probe  
 Sampling Valve  
 Agitation System  
 Direct Drive  
 Disk Turbine  
 Draught Tube  
 Magnetic Drive  
 Top Drive  
 Impeller  
 Aeration and Exhaust  
 Autosterile Filter  
 Air Filter  
 Bubble-Free Aeration  
 Control Valve  
 Flow Meter  
 Gas Mixing Station  
 Incinerator  
 Reflux Cooler  
 Viewing Glass Bursting Disk Assembly

Vessel Accessories  
 Bottle Cap with Sterile Filter  
 Bubble Trap  
 CIP Spray Ball  
 CIP Valve  
 Dosing Valve  
 Foam Breaker  
 Hypodermic Needle with Sterile Case Assembly  
 Illumination Unit  
 Injector Valve  
 Lamella Clarifier Unit  
 Lid Opening Device  
 Rotor Filter  
 Rupture disk  
 Safety Valve  
 Steam Trap  
 Sterile Pressure Gauge  
 Sterile Trap  
 Thermometer  
 Viewing Port

Components for Sterile Lines  
 Diaphragm Valve  
 Multiple-Diaphragm Valve  
 Memtile: Stainless-Steel Valve Drive  
 Pneumatic Valve Drive  
 Pipe-Pt100  
 Sterile Connection  
 TRI-Clamp Connection  
 Vacuum Valve  
 Fermenter Energies  
 CIP-System: Mobil, Kitchen  
 Clean Steam Generator  
 Compressor  
 Cooler  
 Heating Circuit  
 Steam Generator  
 Thermostat

Powder Handling/Mixing  
 Cup Hermann Powder Transfer System  
 Inversina Tumbler Mixer, 2-500 Litres  
 Manual mini-Inversina tumbler mixer

Pumps for Sterile Applications  
 Domp® Double Diaphragm Pump  
 Double Piston Pump  
 Kobio-Pump  
 Magnetic Circulation Pump  
 Peristaltic Pump  
 Piston Diaphragm Metering Pump

BioEngineering

Design and Manufacture of Plants for the Production of:  
 Amino Acids  
 Antibiotics  
 Biomass: Probiotics, Starter Cultures  
 Biopesticides  
 Biopolymers and Lipids  
 Enzymes  
 Ethanol

Flavors and Fragrances  
 Fruit Juices  
 Monoclonal Antibodies  
 Organic Acids

Peptides/Proteins: Blood Factors, Hormones, Growth Factors  
 Sugar Derivates

Vaccines  
 Vitamins

BioControl

Measurement and control  
 BioLogics  
 BioVisual  
 Back up

Data logging  
 Data processing  
 Process analysis

Process management  
 Process optimization  
 Process supervision



Pilot Fermenter P  
 Experience put into practice

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Bioengineering –  
 Experience only  
 specialists can have

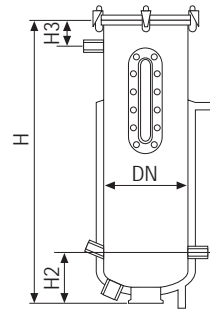
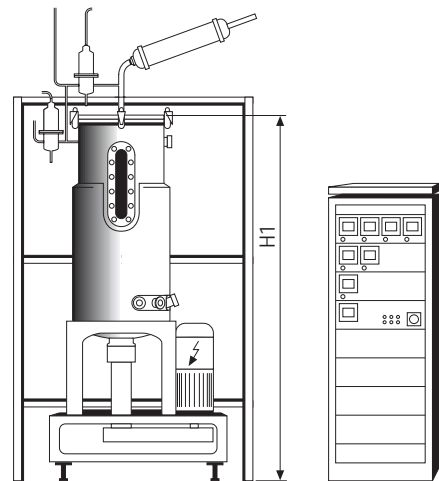
**BIOENGINEERING**

Scale-up or production processes are the field of application for the Pilot Fermenter P with total volumes from 100 up to 1000 litres.

The straightforward concept in design and construction results in a user-friendly and sturdy high-tech plant. The central in- and outlets for steam, water, air, and waste water, minimize installation time and work.

The flexible installation of Bioengineering probes and accessories for media addition, aeration, sampling, harvest, perfusion, foam destruction, CIP, etc. is guaranteed with the standardized ports.

The modular design in combination with the variety of proven accessories enable the performance of biotechnological processes with enzymes, microorganisms, fungi, algae, plant or animal cells.



#### Product overview

		base						vessel
total volume	working vol.	DN	width x depth	H	H1	H2	H3	height x diameter
100 l	65 l	419	1000 x 1000	870	1600	200	125	2 : 1
150 l	100 l	419	1000 x 1000	1170	2000	200	140	3 : 1
200 l	130 l	500	1000 x 1100	1300	2210	200	140	3 : 1
300 l	200 l	500	1000 x 1100	1510	2240	250	140	3 : 1
450 l	300 l	600	1200 x 1200	1700	2450	245	140	3 : 1
750 l	500 l	700	1300 x 1300	2070	2800	350	140	3 : 1
1000 l	650 l	900	1500 x 1380	2180	2990	315	140	3 : 1

#### Technical data

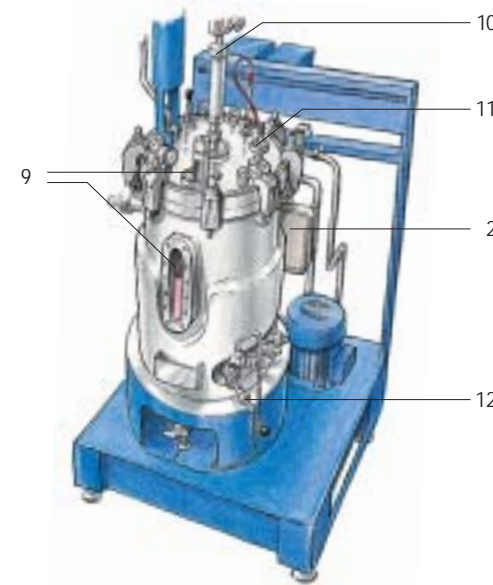
operating temperature	max. 150 °C	
operating pressure	6 barü/g	
operating pressure heating jacket	6 barü/g	
material of parts which are in contact with the product	316L	
motor power	100 l	3 kW
	150 l, 200 l, 300 l	7.5 kW
	450 l	10 kW
	750 l	11 kW
	1000 l	15 kW
speed (standard)	max. 750 min <sup>-1</sup>	

Our equipment fulfils the required national guidelines and cGMP/ FDA-regulations (including IQ and OQ documentation on request).

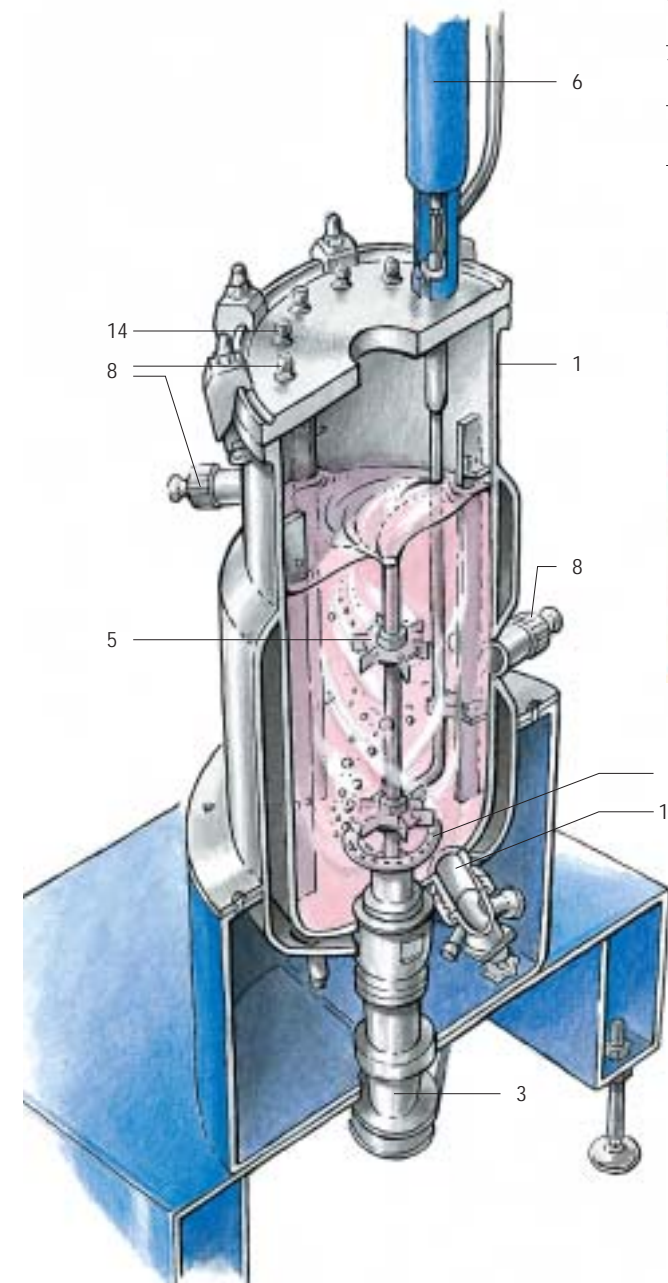
The stirrer units is driven by belt, thus reducing the fermenter height, separating the vessel from the motor, and optimizing the bearing of the free-swinging shaft. The shaft is removed from the top and the bearing with the seals is easily disassembled from the bottom.

The fermenter is aerated through the Bioengineering Autosterile filter. Without any complicated peripheral constructions, this filter is in situ sterilizable together with the fermenter.

The power supply and the measurement and control units in the 19" measurement cabinet are separated from the fermenter. The Bioengineering IFM controllers combine state of the art digital technology with a modular set-up. Each measurement or control loop has its own separate module, thus enabling easy maintenance of single units or the adaption of the fermenter measurement and controls according to actual requirements. The BioLogics or BioVisual software covers all data logging and visualization requirements. On request other software systems are available.



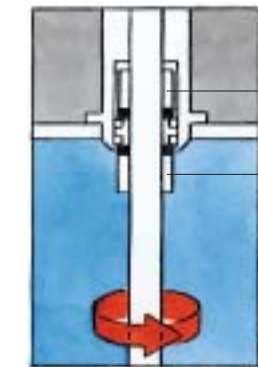
	Standard	Optional
1 Vessel	stainless steel 316L grain 240	special alloys mirrorpolished
2 Heating circuit	closed circuit, galvanized steel, heat exchanger for steam	stainless steel 316L, electrical heater, heat exchanger for cooling circuits
3 Agitation	bottom drive by belt, double mechanical seal	direct drive, magnetic coupling, top drive, Vibromixer
4 Mechanical seal	carbon silicium carbide, glycerine lubricated	steam condensate lubricated
5 Stirrer	blade stirrers, baffles	airlift, draught tube
6 Inlet air	Autosterile filter, ceramic filter	separate filter, double filters, absolute filter, gas mixing station
7 Aeration	submerge aeration	surface aeration, bubble-free aeration
8 Ports	standardized lid and side ports	flexible location and number special ports
9 Viewing glasses	longitudinal and lid viewing glass with illumination	flexible location and number
10 Exhaust air	ceramic filter	absolute filter, reflux cooler, foam destruction, incinerator
11 Inoculation	inoculation port	fixed piping, transfer concepts
12 Sampling	manual sampling valve	pneumatic valve, contained sampling valve, valve with steel bellow, cell-free sampling system
13 Harvest	manual harvest valve with steel bellows	pneumatic harvest valve, fixed piping, transfer concepts
14 Media addition	needle connection through lid	dosage valve, coupling, fixed piping, transfer concepts
Sterilization	manual sterilization of Autosterile filter and exhaust air valve	automatic sterilization of Autosterile filter and exhaust air valve



Vibromixer 3



Double mechanical seal



Magnetic stirrers 3

