H ü W ü S ü Labortechnik

Entwicklung und Fertigung

Laborkomponenten
und -systeme aus Glas,
Metall und Kunststoff

Meß- und Regeltechnik
Laborelektronik

HWS Fermenter
Economy 20:

Modular construction
guarantees the individual
fulfillment of your process
conditions.

H ü W ü S ü Economy Fermenter 10/20

Contents

Short Characteristics

The HWS Economy fermenter is giving you the highest flexibility. You can desire:

different working volumes 1 , 2 , 2.5 , 5 , 6 , 10 and 20 ltr

stirrer systems, motor with/without PC-connection, different stirrer executions

temperature variation by circulators

measurering and control by different modules

You can adapt the HWS Economy fermenter to specific process conditions
to have highest employment.

The fermenter can be sterilized in an autoclave.

The system is easy to handle, all parts can be used even
by un-trained personal.

The control units are equipped with outputs for registration of data.

Economy10/20

Construction and Function:

The HWS- Economy Fermenter is available in 2 different versions:

Economy 10 fermenters with working capacities from 1-5 ltr are executed as desk systems
Economy 20 fermenters with capacities from 6-20 ltr are installed in a moveable stainless steel frame

The culture vessels are manufactured from borosilicate glass tubes with strong walls and a thermo jacket, for good temperature controlling.

The flanges contain a groove for a simple insert of O-ring seals.

The covers are manufactured either in glass (Economy10) or in stainless steel (Economy20).

The stirrers are sealed
Economy 10- dynamic seal
Economy 20- mechanical seal

All covers are equipped with sufficient ports for sensors feeding and harvesting:
Economy 20- 12 ports (stainless steel)
Economy 10- 07 ports (glass,plastic)

The ports are executed in screw threads and caps with septa, or closing caps with seals. In use this has shown to be most practicable.
The stainless steel stirrer shaft can be equipped with different stirrer systems like disc blade, propeller and others.
The systems are easy to exchange and fixable.
The temperature regulation of the culture vessel is achieved by a circulator, which guarantees a high temperature accuracy. Therefore it can be used for thermophile organisms.
The supply of air in the fermenter can be produced by compressed cleaned air with a valve and a gas flow meter; while the air introduction is efficiently aimed by a PTFE distribution ring in the medium.

Other parts like control systems and peristaltic pumps are completing the systems.

Control System

3.1 General

The measuring and control of the process can be executed by the use of different modules.
These modules are mounted in a 19“ rack, containing the main power supply.

The different modules:
- pH measurement/control
- pO_2 measurement
- pO_2 control
- dosing pumps for acid/alkaline
- valve for CO_2
- PT 100 for temperature registration

Stirrer motor and circulator can be equipped with outputs for giving their data to a suited printer.

3.2 Thermostatisation

The heating of media liquids results by a closed circulator and the thermojacket of the glass vessel. The temperature can be measured by an external PT 100.
The prescribed temperature can be inserted by an adjustment.

3.3 Stirring

The stirrer system contains a strong motor which enables a constant rotation. The speed is indicated by a digital-display. If desired the stirrer motor can indicate torque.
Speed and torque can bei registrated by a 0-20 mA output.

Control System

3.4 pH Measurement/-control

The measurement of the pH-values is executed by a sterilizable electrode by Schott. The cable ist connected to the HWS pHR 1402 device, which has to be calibrated before use. The accuracy enables the connection to dosing pumps.
By this constellation a regulation of the pH value is guaranteed.

3.5 pO_2 Measurement

The measurement of the solved oxygen is achieved by a oxygen transmitter 4050e. Each transmitter is equipped with a micorprocessor offering powerfull features through a user-friendly menu-driven Setup programm.
With a potentiometer the zero value can be compensed and with a second measurement in oxygen saturated solution the gradient can be fixed.
The instrument also supports automatic temperature compensation from 0...50°C.
Measurement in ppm, mg/l or % saturation.
All measured data can be shown later with a printer.

Technical Specifications

Culture vessel				
Working Volumes	ltr.	1 2 2.5 5	6 10	20
Diameter int.	mm	150	200	260
Cover		Borosil.glass	s/s	s/s
Ports		7	12	12
Seals		viton/silicone	viton/silicone	viton/silicone

Circulator:

Sensor	PT 100
Working range	0…200°C
Accuracy	0.1°
Constant	0.05°
Heating	2kW
Cooling	water
Control	external PT100
Power supply	230V/50Hz

Stirrer motor:

Power output	30-100W
Speed	50…2000 rpm
Indicator digital display LCD in special execution: with torque indicator and values output	4-20mA
Power supply	230V/50 Hz

Technical Specifications

pH measurement HWS pHR1402:

Sensor:	Sterilizable electrode from Schott
Range:	1-13 pH
Temperature compensation:	automatically
Output:	4-20 mA

Control:

Range:	1 - 13
Adjustability:	0.01
Constancy:	0.01

Temperature:

Temperature indicator:	integrated in HWS pHR 1402
Resolution:	0.01°
Output:	4-20mA

pO_2 measurement of solved oxygen:

Resolution	0.01 mg/l or 0.1 %
Accuracy	+/- 1% of full scalereading
Sensor po_2	polarographic type (Clark)
Sensor Temp.	NTC 22k ohm thermistor
Temperature compensation	auto/manual
Output	4...20mA
Power supply	80...250 VAC

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Ref.No.	
	Economy Fermenter 10
	Culture vessel, borosilicate glass, with jacket, inner Ø 150 mm
8 100 010	- working capacity 1 l
8 100 020	- working capacity 2 l
8 100 025	- working capacity 2,5 l
8 101 150	Glass cover, Ø 150 mm with stirrer guide and 7 screw threads for the introduction of stirrer and sensors
8 200 150	Connection system in stainless steel incl. seal and spare seals
	Economy Fermenter 20
	Culture vessel, borosilicate glass, with jacket, inner Ø 200 mm, complete with stainless steel, cover and ports (5 x 6 mm, 3 x 10 mm, 4 x 25 mm) for insert of sensors, incl. seals, fittings, 4-arm blade stirrer with two planes:
8 100 060	- working capacity 6 l
8 100 100	- working capacity 10 l
8 100 200	- working capacity 20 l

Ref.No.	Accessories
6 550 010	Stirrer motor, without display
6 550 020	Stirrer motor, with digital display
6 560 005	Circulator
6 560 010	Circulator, with digital display
6 611 400	Modul-pH-regulator pHR 1400 incl. mounting
6 600 100	pH-electrod, sterilizable incl. BNC - cable
8 600 015	Electrode protection in stainless steel
6 832 001	PT 100 resistance thermometer
8 600 200	Peristaltic pump for pH-regulation
8 600 205	Magnetic valve for introduction of gas controlled by pHR 1400
8 600 300	Gasflowmeter
8 600 400	Stand with clamp (for Economy 10)
8 600 500	pO**2**-controller
8 600 502	pO**2** eletrode sterilizable
8 600 901	19" rack for controller incl. mounting
8 600 950	Frame construction (for Economy 20)