electrolab

The Fermac 320 - Engineered for precision and adaptability

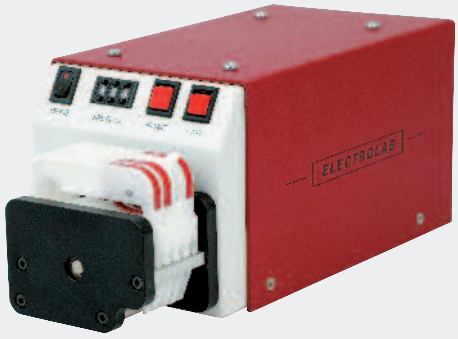
Associated equipment

With our in-depth knowledge of fermentation processes, we have developed the following associated products:-

The FerMac 368 Gas Analyser measures oxygen and carbon dioxide in exit gas, two important extra parameters which give the best indication of growth within a fermenter vessel. The Gas Analyser connects to the FerMac 360 Controller so that measurement can be logged and controlled by our software.

The Fermac 366 Pump Module makes two extra pumps available from the Fermac 360 controller. They can be used as level or feed pumps and can be controlled via our software, allowing complex feeds to be programmed.

The Electrolab Low Flow Rate Pump is specifically designed for bioprocess applications, providing a smooth flow of media with excellent reproducibility over extended periods of time.



OUTLINE SPECIFICATION

Vessels	Bacteriological			Cell Culture			Air Lift
Working volume (Litres)	2	5	10	2	5	10	8
Total volume (Litres)	2.7	6.4	12.4	2.6	6.3	12.3	10
6.3mm Ports	6	5	7	8	7	9	6
12mm Ports	5	7	7	5	7	7	7
25mm Ports	N/A	N/A	N/A	N/A	N/A	N/A	4
Impellers	2 x 55mm	2 x 55mm	2 x 55mm	1 x 50mm	1 x 62mm	1 x 74mm	N/A
Agitation							
Speed Range (rpm)	0-1000	0-1000	0-1000	0-800	0-800	0-800	N/A
Low Speed Option	N/A	N/A	N/A	0-200	0-200	0-200	N/A
Temperature Control							
Heating	Pt100 sensor to measure vessel temperature & low voltage (24V) wrap-around heating system						
Cooling	Integrated cooling coil & baffle			Optional cold finger heat exchange			
Range	From 5°C above cooling water temperature to 50°C						
pH Control	Using autoclavable pH electrode, controlled by addition of acid or base using 2 Watson Marlow peristaltic pumps			Using autoclavable pH electrode, controlled by CO_2 gas flow			As bacterio-logical
Range	0-14 pH with on-screen calibration and electrode monitoring						
DO Control	Using autoclavable polarographic DO electrode, controlled by either stirrer speed, air flow or a combination of both			Using a gas flow controller with air, O_2, N_2 and CO_2			By air flow
Range	0-120% with on-screen calibration and electrode monitoring						
Foam Control	Using either conductivity probe or timer with a variable sensitivity.						
Feed Pump	Fully adjustable, using on and off timers. Maximum flow 6.4 mls/min						
Power	230 volts, 50 Hz OR 115 volts, 60 Hz - Typically 1 kW						
Software	SCADA type software able to control and data-log up to 8 fermenters with either RS232 or RS485 for multiple installations						

To discuss your specific requirements, arrange a demonstration or obtain further information and pricing, contact us:

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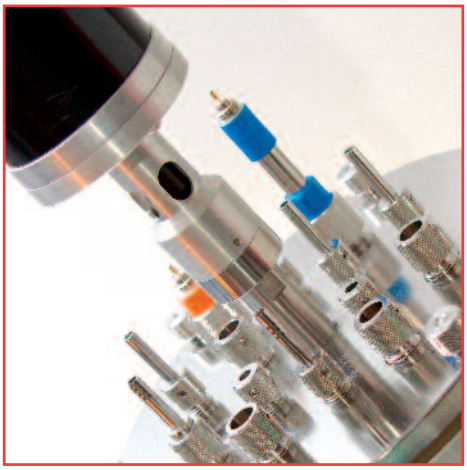
FerMac 320

The FerMac 320 is a medium-priced bioreactor from Electrolab introducing a new range of vessels combined with a variation of our established 360 control system.

This unique combination results in a truly outstanding value-for-money package which offers a very compact, effective unit with proven reliability.

With an expanding range of vessels and a control system pre-configured to allow extra parameters to be added at a later date, the FerMac 320 is the obvious choice to meet your laboratory's needs both now and for the future.



FerMac 360 Controller

The FerMac 360 has an intuitive easy-to-use interface where all your key parameters can be displayed on a single screen and the set-up & calibration for each parameter is available with a single key stroke.

Spare parameter channels allow easy upgrades for redox, optical density, CO_2 etc - almost any measurable probe can be added at a later date. In addition, the FerMac 360 has links to our purpose designed data-logging and control fermentation management software.

*The FerMac 360 has **built-in** motor-drive eliminating the need for an external motor-drive module and resulting in an extremely compact, efficient unit.*

As standard, the unit is supplied with 4 Watson Marlow easy-to-load pumps, all with manual over-ride facility. However, with the addition of our FerMac 366 Two-pump Module, this can be increased to a total of 6. The FerMac 360 is pre-configured to take this and other modules such as our FerMac 368 Gas Analyser.

FerMac 320 Agitation

The FerMac 320 agitation system is equipped with a powerful direct drive motor carefully designed with a locking system to ensure that the motor cannot be accidentally removed from the vessel whilst being easy to remove with a simple twist.

Uniquely, the locking system also tightens as speed is increased to give a positive, vibration-free drive at all speeds.

For cell culture work, the option of a very low speed motor gearbox is available.

FerMac vessels

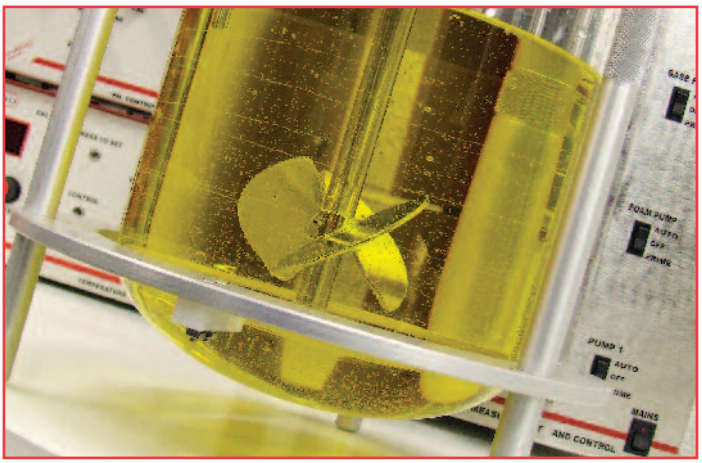
The FerMac 320 range of vessels all incorporate the same high quality materials and design as other FerMac vessels.

The full thickness top plate of 316L stainless steel has all ports machined within it so that O-ring seals are made on the sterile side of the vessel to reduce crevices or cross-over contamination. The ports are available in two sizes to take all standard probes and fittings for sampling, inoculation, addition etc and, within each size, are completely interchangeable.

An integrated twin baffle and cooling coil attached to the top plate allows quick removal for easy cleaning.

Bacteriological Vessels

The aspect ratio of the FerMac 320 vessel is optimised for bacteriological use. In addition, maximum oxygen transfer is achieved by combining two Rushton Turbine impellers with flat-bottomed glassware.



Cell Culture Vessels

Specially designed for both mammalian and insect cell culture, the FerMac 320 glassware has a dish-shaped bottom for use with our low shear cell culture impellers. These are available in a wide range of sizes in both up-draft and down-draft configuration. We also have a range of variable pitch cell culture impellers which can be useful for experimenting when dealing with difficult mixing situations.

Our sparge tube is the newly designed cylindrical stainless steel type with porous tip to give maximum gas transfer.

Air Lift Vessels

The Electrolab Air Lift bioreactor provides an excellent alternative to the standard stirred vessel system. Agitation by air lift ensures minimum shear stress whilst allowing very high oxygen transfer rates. It can used for both bacteriological work and cell culture as well as many specialist applications.

FerMac 320 Services Plate

The FerMac 320 is supplied with a separate free-standing services plate which ensures that water and gases are safely segregated from the electronics.

It comes complete with a precision flow meter for air and, (for cell culture work), O_2, N_2 and CO_2. Each flow meter has "easy-change" flow tubes to allow the gas flow range to be altered to suit your individual requirements.

Software

Every FerMac 320 system is complete with our easy-to-use SCADA software. This versatile package, based on National Instruments Labview®, allows both data-logging and control of up to 8 bioreactors at one time and has the ability to compare past and present fermentation runs.

Supplied licence-free, allowing data to be viewed on other computers either at home or in the office, it also has a built-in simulator - a combination which is ideal for training purposes.

The data is Microsoft® compatible ensuring easy export into Excel or Word.

The FerMac 320A

In addition to our existing extensive range of vessels, we can now offer the FerMac 320A. This vessel was designed to offer a real alternative to users of Applikon® systems who may feel they are locked-in to one supplier when it comes to adding to their capacity.

The FerMac 320A offers the same vessel characteristics as original Applikon® vessels with full interchangeability of parts combined with the high quality of all Electrolab vessels.