

Bioreactor product catalog

With 500-1000 mL vessel



500 mL Glass Vessel

Stirrer coupling Stirrer shaft **Recommended by Bearing housing** E.coli Sampling ports Sensor adaptor (PG13.5) Headplate (Stainless steel) Temperature probe socket Impeller (Flat blade/Rushton/Marine) Sparger Borosilicate glass vessel Headplate Ø 86 mm • 5 pcs PG13.5 ports Compatible with 120 mm Sensors Temperature probe . Socket ø 6mm Sampling port (Customisable)

Stirring - 1200 rpm



64W 24VDC 0.2N.m NEMA17 Brushless DC servo motor

Stirred tank bioreactors (STBRs) are the reactors most widely employed for culturing of biological agents such as cells, enzymes, or antibodies.



Motor torque: 0.2Nm

Temperature control

A Peltier (or thermoelectric) cooling system is based on a DC voltage running through two junctions joined by thermocouples. Thermocouples comprise two electrical conductors with different Seebeck coefficients, usually semiconductors.



Thermoelectric temperature control system

PID, which stands for **P**<u>roportional</u> **I**<u>ntegral</u> **D**<u>erivative</u>, controllers use a control loop feedback mechanism to control process variables and are the most accurate and stable controller.



The circuit is measures the actual current and log it so the user can estimate how much heat generated by cells.

Digital Mass Flow Controller

A mass flow controller automatically controls the flow rate of a gas according to a set flow rate sent as an electric signal, without being affected by use conditions or changes in gas pressure.





Opens up a possibility to an automatic Oxygen Transfer Rate determination

Rotameter (variable area meter)

A rotameter is a device that measures the volumetric flow rate of fluid in a closed tube. It belongs to a class of meters called variable-area flowmeters, which measure flow rate by allowing the cross-sectional area the fluid travels through to vary, causing a measurable effect.



Peristaltic pump

High Precision Peristaltic Pumps for even low 200uL/h liquid addition.

Variable assignment of pumps to control functions (acid, base, antifoam, feeds)



- Automatically add acid, alkali by peristaltic pump and control pH accurately
- Automatic feed start triggered by DO/pH-spike
- Automatically check foam, automatically add antifoam by peristaltic pump.

For higher flow rate *⇒* EZO-PMP[™] Embedded Dosing Pump

- Flow rate 0.5ml to 105ml/min
- Accuracy +/- 1%



Inline Sensors

PH Sensor

Compatibility of analog or digital sensors (VP8, K8, S8)



Dissolved oxygen sensor

jFermi system is compatible with polarographic, optical and even galvanic DO electrodes



Other sensors

ORP, Dissolved Carbon Dioxide, Conductivity, Cell Density

Off gas - Carbon dioxide / Oxygen





Measuring Gas: Oxygen Measurement Range: 0.1 to 25% O2 Sensing Method: Fluorescence quenching by oxygen Accuracy: Better than 2% at full scale Resolution: 0.10% / 0.1mbar Temperature Accuracy: +/- 2 degrees C Barometric Pressure Range: 500 to 1200 mbar

Lifetime: > 5 years

Measuring Gas: Carbon dioxide Measurement Range: 0-5% CO2 Sensing Method: NDIR with Gold-plated optics Accuracy: ±70 ppm ± 5% of reading Resolution: 10ppm

Sensor Life Expectancy: > 15 years



jFermi Web Client Mobile Compatible





| FEATURE | jFermi Basic | jFermi Standard | jFermi Premium |
|-----------------------|-----------------|--------------------|-------------------|
| Mobile Compatible | \checkmark | \checkmark | \checkmark |
| Plug&Play Peripherals | \checkmark | \checkmark | \checkmark |
| Data Plotting | \checkmark | \checkmark | \checkmark |
| Data Download | \checkmark | \checkmark | \checkmark |
| Assignable Pumps | \checkmark | \checkmark | \checkmark |
| Email Notification | × | \checkmark | \checkmark |
| Secure Remote Access | × | \checkmark | \checkmark |
| Remote Vendor Suppor | × | × | \checkmark |
| Scripting | × | × | \checkmark |
| User Defined Controls | × | × | \checkmark |

jFermi Web Client Data Plotting



| FEATURE | jFermi Basic | jFermi Standard | jFermi Premium |
|-----------------------|-----------------|--------------------|-------------------|
| Show/Hide Timeseries | \checkmark | \checkmark | \checkmark |
| Offline Data Plotting | \checkmark | \checkmark | \checkmark |
| Zoom-In/Zoom-Out | \checkmark | \checkmark | \checkmark |
| Modify Scale | \checkmark | \checkmark | \checkmark |



| Software Aided Calibration | jFermi Basic | jFermi Standard | jFermi Premium |
|-------------------------------|-----------------|--------------------|-------------------|
| рН | \checkmark | \checkmark | \checkmark |
| Dissolved Oxygen | \checkmark | \checkmark | \checkmark |
| CO2 (Off-Gas) | \checkmark | \checkmark | \checkmark |
| O2 (Off-Gas) | \checkmark | \checkmark | \checkmark |
| Pumps | \checkmark | \checkmark | \checkmark |
| Conductivity | \checkmark | \checkmark | \checkmark |



| Control Targets | jFermi Basic | jFermi Standard | jFermi Premium |
|------------------------|-----------------|--------------------|-------------------|
| Temperature* | \checkmark | \checkmark | \checkmark |
| Dissolved Oxygen* | \checkmark | \checkmark | \checkmark |
| pH* | \checkmark | \checkmark | \checkmark |

* User customizable PID parameters