



EDF-1.2 is innovative twin bioreactor, designed for both research and process development in fermentation and cell culture.

Our twin bioreactor has compact, ergonomic and robust design. Temperature control of the bioreactor vessel is made by innovative temperature control system, equipped with a Peltier element. Consequently, the temperature control is provided without connecting the vessel to the bioreactor cooling water source. Magnetically coupled drive creates good sterility conditions.

Peltier element cooled condensers provide exceptional exhaust gas cooling without usage of circulation water. Robust construction and fan driven heat exchange develops enough power to cool and condense even high temperature processes.



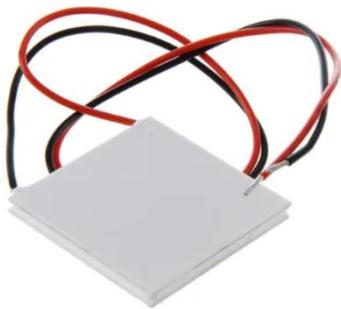
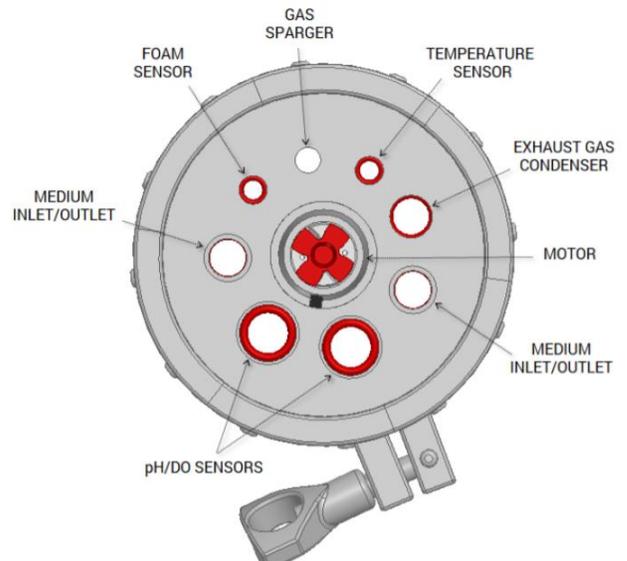
Heating and cooling functions can provide either heating of cooling functions for the glass vessel and can be done independently between both vessels



Easily exchangeable, large 1L glass vessels provide the option to use multiple vessels with the same lid providing the flexibility in day to day operation and easing in research production

Uniform top lid with no welded components for improved sterility and ease of maintenance.

Vessel is equipped with all the necessary sensors and ports for a successful fermentation process



Powerful Peltier element provides possibilities for cooling and heating temperature maintenance from 10-60°C

Novel magnetic drive coupling eliminates the need for a mechanical seal and can provide mixing rate from 40 rpm to 2000 rpm



Model	EDF-1.2
Total volume (L)	0,9
Working volume (L)	0,4 – 0,7
Inside diameter (mm)	85
Inside height (mm)	165
Overall dimensions of the bioreactor (mm)	540 (W) x 350 (H) x 410 (D)
The minimum size of the autoclave chamber for vessel autoclaving (mm)	160 (Height) x 150 (Diameter)
Aeration, mixing	
Aeration (standard)	Air supply, including pressure reducer with pressure gauge, flowmeter (air – 2 l/min); ring bubbler; incoming and exhaust gas filters; easy folding exhaust gas condenser
Aeration (optionally – for cell cultures)	Separate gas or gas mixture supply to the surface of the culture
	Microsparger
	MFC for air, O ₂ , N ₂ , CO ₂
	Gas mixing (Air, N ₂ , O ₂ , CO ₂)
Mixing	Top placed motor with novel magnetic drive
Impellers	Two standard Rushton turbine type agitators for microbial cultures
	Stirrers with inclined “propeller” blades for cell cultures to ensure gentle stirring regime (optionally)
Mixer rotation speed (rpm)	40 – 2000
Ports	For mixer/agitator drive; for pH, pO ₂ , T, foam and liquid level sensors, port with three needles for introducing additives to control the pH, level and foam; hemostat tube for pumping of the product; aseptic pierceable membrane port, a port for the incoming gas with a filter of 0,2 micron, the condenser exhaust gas with a filter of 0,2 um, aseptic sampler
Control unit	
Frame of the control unit	Made from stainless steel A304, dimension 300 x 450 x 600 mm

Controller, control panel	Industrial microprocessor PLC- Siemens Simatic ET200SP (S7-1500 series). Digital Operator is a tablet with Windows 8 operating system
Communication	1) Ethernet connection to SCADA PC
	2) Ethernet connection to IAN or WAN for remote maintenance
	3)WiFi connection (VNC server) for smart phones and tablets
Sensors (standard)	Temperature, pH, pO ₂ , foam / liquid level
Temperature control	Heating and cooling is controlled by an innovative system consisting of a <i>Peltier</i> element. Limits of temperature control from 15 °C to 45 °C. Measurement accuracy ± 0,1 °C; accuracy of temperature within the prescribed limits ± 0,2 °C
pO ₂ control	Polarographic sterilizable pO ₂ sensor (Hamilton or equivalent, length 160 mm). Optionally pO ₂ optical sensor. Automatic pO ₂ cascade control. Limits of pO ₂ measurements: 0 – 150 % (± 1%) of saturation
pH control	Sterilizable sensor (Hamilton or equivalent, length 160mm). Automatic control by acid and base peristaltic pumps. Optionally via CO ₂ or ammonia supply. pH control range 2 – 14 (± 0.02)
Foam, liquid level control	Sensors based on measuring the electrical conductivity. Level control via peristaltic pump
Peristaltic pumps for introducing technological additives	3 freely configurable built-in pump with digital control (ON / OFF), and an analog supply pump with a constant flow rate of the solution (option)
Peristaltic pumps for introducing the substrate additives based on a given program	An optional pump may be used with a variable feeding speed, controlled by the analogue signal from the control unit
Communication and data exchange	Remote access system for wireless control of the cultivation process (via Wi-Fi) with the use of smart phones or tablets
Power supply	Part of the electric power supply, 220 V, 50 Hz.
SCADA software for the collection, processing, visualization and documentation of process data (option)	SCADA BioRe for monitoring, reporting, archiving and full process control, develop according the requirements of 21 CFR Part 11 (code of federal regulation from US Food and Drugs Administration). Software development is based on ARC Informatique Pc Vue industrial development package and includes remote access via the Internet