Thank you very much for your trust and support to our company. It is our pleasure to provide you with information about the Eu210 series laboratory advanced fermenter developed and manufactured by HOLVES:

Eu210 Series

Laboratory Advanced Fermenter

High-end configuration, Highly Expandable



(Product Reference Chart)

Deeply expandable flagship fermenter

Eu210 series advanced fermenter is a flagship fermenter system developed by HOLVES for professional laboratory users. Standard imported thermal mass flow meter MFC, automatic ventilation, main control and communication using bus mode. Eu210 has powerful computing power, stable operation ability, high scalability, and can be connected to external weighing balance, exhaust gas analysis, ORP, biomass

analysis, etc. It is a product that is deeply used by laboratory fermentation users.

Eu210 series fermenter also undertakes the latest generation of research and development tasks of Holves: launch the same type of controller suitable for fermenters of various imported brands. At present, the vessel system of well-known brands such as NBS, Sartorius and Applikon has been tested. Eu210 series with the advantage of a full-featured controller, it is evolving into the latest generation of Holves' key products.

INTELLIGENT APPLICATIONS

Name	Functional Description
H-Mix® stirring system	• Innovative no machine seal design, the first in the industry, for a cleaner and more hygienic stirring system • It can be used without installation • Adjustable mixing parameters within a customizable time period
Feed-Sup® feed system	• Customizable manual and automatic replenishment on time. • can be cascaded with pH and DO to precisely control the parameters. • Equation replenishment and index replenishment are added to fit the growth process of bacteria and meet the high-density fermentation/culture control.
Meta-Tri® Audit trail	• Exclusive developed system can automatically store operation records. Experimental process can be tracked • Real-time protection of experimental data, advanced permissions can restrict export and deletion to prevent data breach
Smart-SC® Intelligent sequential control	• Unlimited customized time period to regulate TEM, pH, DO, mixing, replenishment and other parameters. • To meet the needs of customers for different parameters at different times of the experiment, to realize highly automated management, saving a lot of manpower and time.
HF-Control V2.2 Control Software	• Data visualization: important data dial display, fermentation state animation: stirring, heating, defoaming, etc. • PV/SP value display on the same screen: (PV is measured value, SP is set/given value) no need to switch back and forth. • Full functions: curve data, alarm, correlation, data exportable, basic running data, administrator rights can be set, language switching, etc. • Multiple system interface, customized design: display multi-vessel data on the same screen, convenient for users to operate multi-linked, can switch between the main control and individual vessel interface.

COMPONENT BRANDS

NO.	Name	Brand Description
1	pH sensor	**HAMILTON**
2	DO sensor	**HAMILTON**
3	pH / DO signal line	**HAMILTON**
4	Controller	**Germany Siemens High-end Series, independent intellectual property rights of PID program controll**
5	Touch-screen	**HMI TPC10**
6	Peristaltic pump	**Watson-Marlow**
7	Feeding bottle	**SCHOTT**
8	Thermal mass flow meter	**Vögtlin**
9	PT100 sensor	**JUMO**
10	Low-voltage electric	**SCHNEIDER**
11	Cold water quick coupling	**CPC**

TECHNICAL PARAMETERS

NO.	Name	Technical Parameters
1	**Vessel**	★ Full volume: 3L, if upgarde to big vessels, no need to replace the controller • Liquid volume: Max. 80% • Design pressure: Max 0.15Mpa • Glass vessel: high temperature resistant borosilicate glass • Fermenter lid: AISI 316L with fine grinding and electrolytic polishing ★ Fermenter lid inlets: Air inlet, four-in-one feed inlet, temperature tube, cooling coil, pH/DO electrode inlet, feed inlet, alternate inlet, offgas condenser(detachable), harvest tube, defoamer electrode port

2	**H-Mix® stirring system**	• Servo motor with high precision and low noise. Special mechanical seal • RPM: 0~1000rpm ±1rpm ★ Innovative no machine seal design, the first in the industry, for a cleaner and more hygienic stirring system • It can be used without installation ★ Smart-SC® intelligent smooth control, adjustable mixing parameters within a customizable time period
3	**Air inletsystem**	• Air inlet: Air, quick disassembly structure ★ Imported thermal mass flow meter • Annular gas distributor, optional microporous bubble distributor
4	**pH**	• Range: 2.00~12.00pH, precision: ±0.02 • Sterilization temperature: 0~140°C ★ Controllor: HN-K integrated transmitter with filter, signal isolator and RS-485 communication ★ Association setting: pH is automatically associated with acid-base pump, dead zone customization ★ Smart-SC® intelligent smooth control, custom time period regulation of pH
5	**DO**	• Range: 0~100% O2 saturation, precision: ±0.1% • Sterilization temperature: 0~140°C ★ Controllor: HN-K integrated transmitter with filter, signal isolator and RS-485 communication ★ DO and stirring, replenishment multi-stage cascade regulation, to ensure sufficient gas output during the experiment ★ Custom time period regulation of DO
6	**TEMP control system**	• Electric heating mode of thermal blanket and cooling water to dual temperature control • 24V safe voltage • Temperature control range: Cooling water+5°C~65°C ±0.1°C • Temperature sensor: Imported PTI00 platinum electrode(quick disassembly resistant to high temperature)
7	**Cold water module**	• The cooling water system is controlled by the integrated Eu-M controller, which communicates with the host PLC and the solenoid valve controls the on/off ★ Cooling water connector adopts imported self-locking fast interface, the interface contains self-locking valve ★ Temperature value can be adjusted as needed at any time

8	**Peristaltic pump**	• 4 channels peristaltic pump including FOAM / FEED / ACID / BASE ★ Imported flip peristaltic pump, quick connection ★ Peristaltic pump: Accumulated flow, instantaneous flow, speed adjustment, 100% adjustment, associated PID adjustment, manual control and other functions ★ Feed Supplement system：Support direct, timed, exponential and equation replenishment ★ With Smart-SC® intelligent smooth control can be adjusted at any time according to the needs of the supplement parameters
9	**Defoaming system**	• Mechanical defoaming paddle with rake and compression • Defoamer: Flow addition by peristaltic pump • High-sensitive defoaming electrode
10	**Sampling**	• Sterile sampling system: autoclave sterilization • Syringe negative pressure design: remove bacteria contamination during sampling
11	**Eu-M Controller HF-Control Control system**	• 10 inch HMI touch screen, brightness>350 cd/m2 • The second generation graphical interface makes the experiment parameters clear at a glance, realizes Data and information visualization, information charting, better human-computer interaction, and more convenient experiment operation • Siemens SIMATIC - 1200 Series high-end processor • Low voltage electrical appliances use schneider and other international well-known brands ★ HF-Control V2.2 embedded control software configuration for full local operation • pH / DO / T can realize automatic and manual control • Curve display, historical data records and USB export functions of RPM / pH / DO / T • Four-way Air intake, O2 / N2 / CO2 control and display (with option) • Online display: OUR / CER / RQ (with option) ★ Meta-Tri® audit trail：Exclusive developed system can automatically store operation records. Experimental process can be tracked • Real-time protection of experimental data, advanced permissions can restrict export and deletion to prevent data breach ★ Scalable: ORP, biomass, balance, external peristaltic pump, exhaust analyzer (including imported and domestic), etc ★ It can be used with the Analysis software HW-Analysis V1.0 ★ External OPC XML DA via Ethernet data communication
12	**Power**	• Input: AC110~240v/1.2kw • Output: Motor, thermal blanket, peristaltic pump and other power parts use 24V safety voltage

★ Refers to features and key functions for HOLVES fermenter Eu210