



AFC 900 Series Dual Bioreactor Controllers



Cell Culture & Fermentation Applications For Research & Process Development Laboratories

Designed as a “drop-in” replacement system for benchtop and pilot scale reactors, the AFC line of bioreactor controllers outclasses its competition thanks to a reliable, dedicated and open process control system.

Customizable Hardware

Built with industrial grade, off-the-shelf components, these customizable bioreactor controllers are designed with long-term support and operation in mind.

AFC 900 Series Offers Built-in Support for Smart Probes

Mettler-Toledo: ISM pH/Redox

Hamilton: Optical dCO₂ and/or Capacitance Cell Density

ABER: Biomass Monitor

Optional Water Box for temperature control of **jacketed** reactors and cooling loops

Standard 350 W stirrer motor (~0.5 HP) supports 2-15 liter reactors



AFC 927 4 VS pumps per reactor



AFC 927 Plus 1 4 VS pumps & 1 micro pump per reactor



AFC 929 6 VS pumps per reactor

Design Principles

- ✓ Use open, **non-proprietary**, readily-available, quality components
- ✓ Design our equipment to be **serviceable** by the customer
- ✓ Design solutions that are **tailored** to the customer's needs
- ✓ **Customize software & interfaces** to match the customer's requirements
- ✓ Provide complete **documentation** & source code
- ✓ Provide ongoing, personal **support & technology upgrades** for our customers & products



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Specifications

Conventional Data Transmitter/Receiver Connections *(per reactor)* Qty.

Mettler-Toledo M80/M100SM Modbus, ISM pH/Redox	1
Hamilton or Mettler Optical DO Modbus	1
Hamilton Modbus (Optical dCO ₂ and/or Capacitance Cell Density)	2
Temperature (PT100)	1
Analog pH	1
Analog DO	1
Foam (optional)	1

Additional Controller I/O *(per reactor)* Qty.

110V AC Power Plug for Heating Blanket (Heat only temperature control)	1
RS-232 or RS-485 Serial Ports for Digital Scales (or other devices)	2
Add'l 4-20 mA or 0-10 volt Analog Inputs	4

Communication Connections

- MODBUS TCP Communication Interface
- Keeware OPC (sold separately)
- Digital Communications with Alicat MFCs (max 6/reactor)

Included Hardware *(per reactor)* Qty.

RTD PT100 Temperature Probe with cable (6mm OD)	1
Servo Motor & Controller	1
Coupler "Snout" to connect Servo Motor to the Agitator Shaft	1

Software Specifications

PID Loops for Temperature, pH, and DO as per customer specification, includes:

Temperature - jacket/blanket, heating/cooling

DO Cascade to agitation/gas mixing

Setpoint Deadband for pH

PID Integral Deadband

Acid/Base/Gas mixing for pH

Setpoint profile

Weight Loss PID with Scales & Pumps - Mass Flow, Mass Charge, Level Control

pCO₂ PID with CO₂ and Air/N₂

Level Control for Perfusion

Calibration for all measurements (pH, temperature, gas flow, agitation, DO, pCO₂)

AFC 927 Dual Bioreactor Controller

AFC controllers are **customizable**

8" color HMI touchscreen

Control up to 2 reactors from any vendor

Up to 6 Watson Marlow variable speed pump heads per reactor

