PendoTECH Bioreactor Control System

- Optimized for disposable and glass bioreactors
- Complete process control, alarm condition monitoring, and data acquisition
- Ability to use standard pH and dissolved oxygen probes and/or optical sensors via remote optical transmitter
- Vessel weight control for perfusion processes
- Vessel pressure monitoring with single use pressure sensor

Bioreactor Control System Designed for Single Use and Disposable Bioreactors

Large scale glass or single use bioreactor processes may benefit from a simple, easy to use bioreactor control system. The ability to control parameters such as pH, dissolved oxygen (DO) with PID control, temperature, mixer speed, and weight are required. The ability to measure pressure, control alarms, and acquire data are also a necessity with a bioreactor control system. Using an embedded transmitter from Mettler-Toledo, an industry standard, for monitoring pH and DO with standard probes and controlling DO delivers the advanced features and confidence required for measurement and control of the bioreactor. The ability to use in parallel for strictly monitoring or for process control new optical pH and DO sensors give the ability to compare old and new technologies or to move to new technology with confidence.

pH is controlled by base addition or CO₂ addition and DO is controlled by air or O₂ addition and there is also headspace gas control. Over-pressure of the bioreactor may occur due to a vent filter clogging or other reason and to prevent a vessel failure, pressure monitoring and control is critical. The highly accurate pressure sensor (< +/- 2% of reading) provides monitoring of the pressure in the headspace and will instantly shut off all gases and pumps if there is a high pressure alarm. Alarm setpoints are also available for all process parameters and there is an air detector on the base pump tubing that indicates if the base container is empty. Added features include vessel weight control by maintaining a user-entered weight setpoint with the media pump and also the ability to "charge" a vessel with media to a desired weight setpoint. There is an advanced perfusion option to monitor and control external devices such as an external hollow fiber filter.
**Product Details**

- Real-time data output to a PC for data acquisition and analysis
- Automated control of pH by base pump control and CO2 gas valve control
- Automated control of dissolved oxygen by control of air and oxygen gas valves
- Ability to use the embedded Mettler-Toledo M-300 pH and DO transmitter for traditional probes with its advanced features and versatile DO PID control for enhanced process control
- Ability to use new optical pH and DO sensors in parallel for strictly monitoring or for process control that gives the ability to compare old and new technologies or to move to new technology with confidence
- Monitor and control temperature and impeller speed

- Monitoring of process parameters for alarm conditions that will shut off pumps and gasses and trigger alarm output circuit including air detector on the base pump tubing that indicates if the base container is empty
- Perfusion run mode that will continuously feed media to maintain vessel weight and optional perfusion expansion model that will monitor and control an external hollow fiber filter module
- Charge mode that will fill vessel with media to a desired set point
- Single use pressure sensor input for bioreactor pressure monitoring
- Control of valve for head space overlay gas
- Advanced perfusion option includes control of circulation pump, filtrate pump and monitoring of three pressure sensor

**Specifications and Standard Accessories**

**Detail** | **Specifications**
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Enclosure Dimensions (h x w x d) | 4.8” x 13.8” x 10.3” (12.2 x 35.1 x 26.3 cm)
Enclosure Weight | 6 lbs. (2.8 kg)
Enclosure Material | Aluminum
Power Requirements | 100-240 Volts, 50-60 Hertz, 2 amp max
Pressure Sensor Input(s)* | PendoTECH Single Use Sensors (-7 to 75 psi; +/- 2% of value from 0 to 6 psi)
Pump Control Outputs* | Speed control: 4-20mA, 12-bit (4,096 counts)
Start/Stop: Relay 3 - 48VDC, up to 3A continuous
Air Detector Input | Digital input with 5V supply
BR Motor Temp. & Speed Inputs^ | 4-20 mA input, 16-bit (65,536 counts)
BR Temperature Control^ | On/Off: Relay 3 - 48VDC, up to 3A continuous
BR Speed Control^ | 0-10VDC, 12-bit (4,096 counts)
Sparge Gas Valves* | 24VDC for Oxygen, Air, and CO2 controlled by relay (2.4W max each)
Alarm Output | Relay 3 - 48VDC, up to 3A continuous, NO/NC selectable
Scale Inputs | RS232 with user selectable scale profiles
Overlay Gas Valve | On/Off: Relay 3 - 48VDC, up to 3A continuous
External pH and DO transmitter | 0-10V input, 16-bit (65,536 counts)

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*12 foot cable included  ^ 12 foot, 8 wire SPEED/TEMPERATURE cable included

**Part Number** | **Description**
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PDKT-PCS-BRBA | Bioreactor Control System with pump cables, pressure sensor cable, and air detector
PDKT-PCS-BRCF | Perfusion option for basic system includes filtrate pump control and three pressure sensor inputs for integration of hollow fiber filter
PDKT-GSTAND | Gas blending stand with solenoids

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Incorporated into the system is the Mettler-Toledo M300 pH/DO transmitter that delivers superior accuracy results that are guaranteed by proven measurement technology and sensor diagnostics.

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