ACU-TROL® AK600™
ULTIMATE COMMERCIAL EQUIPMENT ROOM CONTROLLER

AQUATIC FACILITIES • COMPETITION POOLS • RESORTS • HOTELS & MOTELS • MUNICIPAL POOL

MULTI-FUNCTIONAL FULL EQUIPMENT ROOM CONTROLLER

The Acu-Trol AK600 controller is the most advanced multiple pool controller available, providing the ultimate in equipment room automation. Up to sixteen output relay combinations, configurable for up to six types of control. The Acu-Trol AK600 controller can be customized for any facility, with voltage-configurable control relays and bi-directional control, database information options accessible via direct link, dial-up, wireless modem and ethernet connectivity. With control of chemicals, pumps, filters, heaters, air handlers, chloramine reduction systems and the ability to interface with building management systems for up to 3 bodies of water, the Acu-Trol AK600 controller completes any aquatic facility.

STANDARD FEATURES

- AcuCom™ Software

- Multiple pool control for 1, 2 or 3 pool configurations

- Programmable pH, ORP and temperature set points

- Programmable proportional feed for precise chemical feed

- Programmable acid, CO_2 or base feed for pH control

- Auto backwash filters for up to two bodies of water

- Flow cell with built-in flow switch, shut-off valves, inlet strainer and sampling port

- 16 relays with three (3) voltage configurations

ACU-TROL® AK600™ EQUIPMENT ROOM CONTROLLER
OPTIONS AND FEATURES

OPTIONS

- **AcuManage™ II Software**
  Notification alarms and sensor readings
  AcuManage II available via AcuPort™
  Connectivity communication only

- **AcuPort Connectivity System**
  Ethernet, WiFi or RS422/485

- **Input/Output Modules**
  AK245™ Quad 4-20mA/0-5VDC Output

- **AKColor™ Sensor System**
  The AKColor Colorimetric system
  measures PPM of free chlorine
  with the DPD (N, N-DIETHYL-P-
  PHENYLENEDIAMINE) test

- **Influent/Effluent Pressure Sensor**
  Pressure information for control of an
  automatic backwash

- **Optical Level Sensor**
  Measurement and automatic control
  of water level

- **Digital Flow Sensor**
  Displays flow rate in gallons per minute

- **Conductivity Sensor**
  Measurement of water TDS

- **Premounting**
  Mounted on easy to install polypropylene
  predrilled board

FEATURES

- **Sensors**
  The Acu-Trol AK600 controller sensors
  are capable of measuring ORP, pH, free
  chlorine, conductivity, temperature, flow
  rate and pressure

- **Flow Cell**
  The AK1200™ Flow Cell offers inlet and
  outlet valves for sensor protection and
  third outlet for ease of water sampling

- **Relays**
  Customized relay control for up to 96
  combinations

- **Colorimetric Compatible**
  Compatible with the AKColor
  Colorimetric PPM sensing measurement
  system for free and total chlorine

- **Readings**
  The Acu-Trol AK600 controller displays the
  Puckorius, Langelier or Ryzner indexes and
  differential influent and effluent pressure

- **Data Recording**
  In the absence of power, the Acu-Trol
  AK600 controller will retain programming
  information, calibration, and
  recorded data

- **Alarms**
  Alarms are activated by sensor
  measurements and will communicate
  at two hour increments until alarm
  is cleared

- **Communication**
  The Acu-Trol AK600 controller
  communicates using the AcuCom™
  and AcuManage II software. Software
  packages provide wireless
  communication with modem modules

- **Security**
  Password protected allows limited access
  3 levels with 7 unique passwords

PROGRAMMABILITY

- ORP calibration
- pH, ORP and temperature set point
- ORP super-chlorination
- PPM control
- Temperature calibration
- Proportional feed
- Feeder ON and OFF times
- Mix times and cycle times
- Overfeed lock out times
- Acid/Base feed pH control
- Auto backwash filter settings
- Water level

ALARMS

- pH Alarms
  pH set point ± percentages
  Overfeed disables pH feed
  Flow switch disables pH feed
  High pH disables sanitizer feed

- ORP Alarms
  ORP set point ± percentages
  Overfeed disables disinfectant feed
  Flow switch disables feed

- Auto probe clean
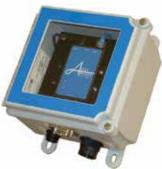
- 16 pager numbers

- 7 passwords

AKColor System

ACUPORT SYSTEM
ACUCOM SOFTWARE
ACUMANAGE II SOFTWARE

OPTIONAL CONNECTIONS

AcuPort System

The AcuPort system provides connectivity via Ethernet, WiFi or RS-422/485 communication interfaces. The port provides dedicated communication to either the Acu-Trol® AK110™, AK600™ or AK400™ Controllers. New features for the AcuCom software application offer direct connection via TCP/IP.
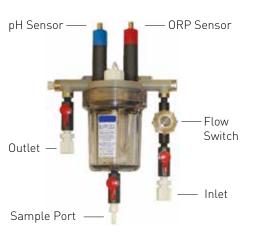

AcuPort System

AK1200 FLOW CELL AND SENSORS

Flow Cell

- Convenient inlet and outlet ports
- Built-in flow switch to disable feed in no flow conditions
- Sample port for testing
- Clear acrylic viewing jar

Sensors

- pH and ORP
- Temperature
- Flow

pH Sensor — — ORP Sensor
Outlet —
Flow Switch
Inlet
Sample Port —

pH and ORP Sensors

ACUCOM AND ACUMANAGE II SOFTWARE

Access essential water chemistry information instantly.

AcuCom software and the AcuManage II software provide interactive control of multiple bodies of water with the click of a mouse from any PC. View multiple locations at once and manage water chemistry without unnecessary service calls. With the AcuPort system, the data management system goes mobile and completes the Acu-Trol AK110 controller equipment room package.

- Remote access from AcuCom software packages (requires optional communication modules)

- System will call out alarm conditions up to 16 pager numbers or e-mail addresses

- Over 540 days of data can be internally stored in two (2) hour intervals or 270 days in one (1) hour intervals

AcuManage II Software

SPECIFICATIONS

- A programmable chemical automation system shall be furnished for the continuous monitoring of the following pool and spa parameters: pH, disinfectant levels, temperature, conductivity, flow rate, and differential pressure. The controller shall be capable of incorporating expansion modules that shall be capable of controlling pH, disinfectant, filter differential pressure, and colorimetric PPM, among others. Installation of the system shall be as specified by the manufacturer and no exceptions shall be taken. The water monitoring software and programmable controller systems as specified below will be provided. A factory authorized representative shall provide training to the owner.

- The system shall be a Pentair Commercial Aquatics™ Acu-Trol AK600 controller or a technically equal system capable of providing continuous automatic monitoring and control of water chemistry, temperature, and various other items on up to 3 separate bodies of water. A controller that cannot measure and control three (3) bodies of water simultaneously will not be considered equal.

- The controller shall be capable of controlling sensors for the measurement and control of the water system. The controller shall have the ability to calibrate all sensor inputs. The controller shall provide separate electrical isolation for the sensors. Controllers not providing separate electrical isolation for the following sensors are not considered equal. The controller shall be capable of measuring using the following sensors: ORP: (1 to 3 isolated inputs), the sensor range shall be 0 to 999 mV with a 1 mV resolution. pH: (1 to 3 isolated inputs), the sensor range shall be 4.22 to 9.70 mV with a 0.02 resolution. Free Chlorine: (1 to 3 isolated inputs), the sensor range shall be 0 to 9.99 PPM with a 0.01 PPM resolution. Conductivity: (1 to 3 isolated inputs), the sensor range shall be 0 to 9999 µS with a 1 µS resolution. This measurement shall be temperature compensated. Temperature: (1 to 3 inputs), the sensor range shall be 32 to 212 degrees Fahrenheit with a 0.02 degree resolution. Flow Switch: (1 to 11 inputs), the sensor shall detect an open or closed condition. Flow Rate: (1 to 6 inputs), the sensor range shall be 0 to 36166 gallons per minute with a 1 gallon per minute resolution. The controller shall provide +12 volts DC for the sensor. Pressure: (1 to 4 inputs), the sensor range shall be 0 to 100 PSI with a 2 PSI resolution. The controller shall provide +12 volts DC for the sensor.

- The flow cell shall include two (2) sensors, one (1) in-line filter, one (1) safety flow switch, and one (1) sampling valve for water testing. The flow cell shall be transparent allowing for visual inspection of the sensors. The flow cell shall also include a valve at the inlet and outlet that may be used to adjust the flow or to stop the flow for probe cleaning or removal. The flow cell shall have two (2) extra plumbing ports. The flow cell shall be designed in such a way that it is not possible for the sensors to be exposed to air. The flow cell shall have a removable reservoir for cleaning.

- The controller shall be equipped to compute and display all four (4) of the following readings: Puckorius Index (pH module required): The controller shall calculate the index for each body of water and shall display the value as one of the following: "Balanced", "Corrosive" (740), or "Scaling" (660). Langelier Index (pH module required): The controller shall calculate the index for each body of water and shall display the value as one of the following: "Balanced", "Corrosive" (-5), or "Scaling" (5). Rysner Index (pH module required): The controller shall calculate the index for each body of water and shall display the value as one of the following: "Balanced", "Corrosive" (670), or "Scaling" (630). Differential Pressure: The controller shall display differential readings based on the two (2) pressure sensors. These readings can be used for control and shall be the basis for automatic filter backwash.

- The controller shall be capable of controlling sixteen (16) relays. The controller shall provide at a minimum ten (10) amps of current for any group of eight (8) relays and twenty (20) amps for all sixteen (16) relays combined. Adjustable DPST and DPDT Relays: These relays shall supply either service voltage, 24 VAC, or act as a dry contact. The relay ratings are 5A at 250 VAC. The 24 VAC current rating is 0.5A total, all outputs combined. The controller shall be capable of multiple relay control on the same measurement. It shall be capable of controlling different types of disinfectant on different relays with different set points all based on the same measurement. Controllers that do not include this capability shall not be considered equal. Default Relay Setups: The controller shall provide means for initially programming any relay to factory defaults.

- The controller's enclosure shall have the rating of NEMA 4X. The controller's dimensions are approximately 12" wide by 13.5" tall by 7" deep with a mounting surface area of 1.13 square feet.

- The controller shall be equipped with a 240 by 128 pixel graphical display as the customer interface. The display shall have a built in touch-screen. This LCD display shall be backlit and automatically light when the screen is touched, and shall remain lit for an adjustable amount of time. Values shall have the capability of being displayed in US and metric units. The controller shall include a virtual QWERTY keyboard, including capital letters, numbers and special characters. Controllers without a touch-screen or a virtual QWERTY keyboard shall not be considered equal.

- The controller shall be equipped with a detailed reset menu and shall allow for the resetting of one or all relays back to the original factory defaults. The controller's relays shall be capable of being configured to control the following: Limiting the maximum length of time a relay shall be ON. Limiting the maximum length of time that a relay can be ON as long as the measurement is greater than five percent (5%) away from the set point. This second overfeed timer shall not be automatically cleared, but shall require the timer count to be reset or for the measurement to reach the set point in order to deactivate. Simultaneous Chemical Feed Lockout. The controller shall not adjust the pH while the disinfectant is in a feed cycle. The ability to turn ON or OFF a relay based on the ON/OFF state of any other relay. Delaying the turn ON of a relay for a settable amount of time. Proportional feed on both the feed ON time and the feed OFF time. The controller shall have the ability to specify the range separately for both. Data recording will keep track of how many times all relays are turned ON and shall allow programming based on this information. Seven (7) day timer that allows for enabling or disabling a relay based on the weekday. Time of Day based commands that allow for enabling or disabling a relay based on the time of day. Control based on volumes of fluids passed through a flow meter. Control based on any of the flow switches installed. Turning ON a relay only one time when the condition is first met. Manually turn ON a relay for an adjustable feed time. Control of multi-port valves. Control primary disinfectant and supplemental disinfectant. Control of enzyme and monopersulfate feeding. Control of circulation pumps.

- The controller shall contain factory-preset configurations or functionally equivalent programming to assist in the assignment of relay functions. ORP Control: This shall allow for very detailed ORP (Oxidation Reduction Potential) based control of the disinfectant. ORP with Super Chlorination: This shall allow for very detailed ORP (Oxidation Reduction Potential) based control of disinfectant. Also it shall include programming for super chlorination. pH Acid Feed: This shall allow for very detailed control of acid feed. pH Base Feed: This shall allow for very detailed control of base feed. Temperature: This shall allow the control of heater systems. Pager: This shall allow for the configuration of pagers. Alarm: This shall allow setup of all system alarms. PPM with ORP: This shall allow for Colorimetric PPM disinfectant control with ORP backup. PPM: This shall allow for Colorimetric PPM disinfectant control. Water Level: This shall allow for the control of the water level in the system. Backwash Filter: This shall allow the backwashing of a filter or filters. Conductivity: This shall control the draining of water if the conductivity moves out of the pre-programmed range or injection of concentrated brine for a salt chlorine generator system. De-Chlor: This control type shall allow for the feeding of a chemical that reduces the disinfectant, typically used after a super-chlorination to bring the chemical values back to desired limits. Probe Clean: This shall provide for the automatic cleaning of the sensors that are installed in the flow cell. The controller shall have HOA controls for sixteen (16) relays that are controllable from the front panel. The HOA shall remain in the same mode when the controller's service power is cycled. The controller shall indicate the selected HOA mode on the screen. Controllers without HOA capability are not considered equal. Hoa: The controller shall be capable of "Hand" relay control. hOa: The controller shall be capable of setting the relay to "Off" not allowing the relay to come on. hoA: The controller shall be capable of "Automatic" relay control.

- In the absence of power, the controller shall retain all setup information, calibration and recorded data for up to 10 years. The controller shall have the ability to record data from all sensors. The data shall be viewable on the front panel and shall be downloadable into the PC. The controller shall allow data recording intervals to be set by the operator with a range of 2 seconds to 18 hours. The Controller shall have the ability to store 6871 measurement lines for 270 days of hourly recordings. Controllers that do not allow at least 271 days or 6871 lines of data will not be considered equal.

- The controller's alarms shall have programmable upper and lower limits. The controller's alarms shall be activated by any relay or sensor measurement. The controller shall send the alarm information by pager, voice or email every two (2) hours until the alarm condition is cleared.

- The controller shall have the ability to communicate to a PC using Windows® based software through the following methods: direct serial communications, modem remote communications, and wireless remote communications. When communication with the controller is established the controller's front panel shall become inactive. The PC screen shall display an exact replica of the controller's display and also emulate the touch screen with the mouse. The graphical data shall be updated on the PC screen at a rate faster than 0.5 seconds when connected with a modem or direct serial connection option and 3 seconds when connected with the wireless communication option. The controller shall be capable of firmware updates when connected either by a direct serial or modem connection. Controllers requiring replacement parts to upgrade the firmware shall not be considered equal. The controller's communication shall allow the user to download the following: sensor data, relay data, and system configuration files. The controller shall allow the user to upload system configuration files to the controller. Modem Remote Communication: The controller shall automatically adjust to operate at the highest modem speed possible. The controller shall detect the most reliable connection speed as the line conditions change. The controller shall be capable of alerting up to sixteen (16) pagers (phone numbers) when an alarm or configurable condition occurs. When the voice option is used, the controller shall use any of the sixteen (16) pagers for a voice communication of the alarm status. Wireless Remote Communication: The controller shall be capable of sending email notifications to up to sixteen (16) email addresses. The controller shall have the ability for sending system alarms and uploading sensor readings to a centralized internet database.

- The controller shall be capable of managing three (3) levels of security accessible via seven (7) different passwords. Each password may contain up to eight (8) digits. The controller shall automatically record the access level when recording data, keeping a record of who has accessed the controller. The controller shall encrypt the password on the display at all times. The controller shall provide a means for communication lockout ensuring that no one else can access the controller remotely. When unattended, the controller shall reset to service level after the display back light is turned off. The controller's backlight timer shall be user configurable. SERVICE: The controller shall provide limited access to the Service Menu. This menu shall provide calibration, manual control of relays, and lockout of programming. This level of security shall provide three (3) passwords allowing multiple personnel to have different passwords. OPERATOR: The controller shall provide operator access to every level of control except Security Setup. This level of security shall provide three (3) passwords allowing multiple personnel to have different passwords. MASTER: The controller shall provide access to every part of every menu.

- The controller for the base bid options shall include pH, ORP, and temperature sensors, flow cell, and a modem with communication software. The controller shall be configurable from one (1) to three (3) bodies of water. The following options are available upon request in addition to the base bid. 4-20 mA Input and or Output: Shall allow the use of up to four (4) modules containing four (4) inputs and or outputs each for a total of sixteen (16) possible 4-20mA sensor inputs and or outputs. 0-5Volt Input and or Output: Shall allow the use of up to four (4) modules containing four (4) inputs and or outputs each for a total of sixteen (16) possible 0-5V sensor inputs and or outputs. Serial Printer: RS232 printer shall be used for on site printing of sensor readings. Optical Level Sensor: This sensor shall provide a measurement for the control and introduction of makeup water into a given body of water. Level Sensor: This sensor shall provide a measurement for the control and introduction of makeup water into a given body of water. Pressure Sensor: This sensor shall provide pressure information to the controller for filter backwash applications. Digital Flow Meter: This sensor shall provide the controller with a means to display the flow rate in gallons per minute. Colorimetric PPM Sensor: Shall provide PPM of disinfectant in the water through a colorimetric method. Conductivity Sensor: Shall provide the measurement of TDS in a given body of water. Below Grade Relay: Shall allow high current loads to be controlled from the controller's internal relays. Wireless Communication Module: This module shall be capable of sending email notifications of system alarms and uploading sensor readings to a centralized internet database. Modem Communication Module with Voice Capability: The module shall allow any of the sixteen (16) pagers to be used for a voice communication of the alarm status. The module shall allow the controller to be called directly and have its system values changed over the phone via a spoken menu system. Filter Backwash Control: This module shall allow control of multi-port valves.

- The controller shall be covered by a standard manufacturer warranty of five (5) years. All pH and ORP sensors will be covered by a two (2) year warranty. Flow Cell will be covered by a one (1) year warranty. This warranty extends to the original retail owner only, beginning on the date of installation, and is not enforceable by any other party. Proof of purchase and/or date of installation will be required to execute a warranty claim. Warranties by Others: Some products incorporate components manufactured by other manufacturers. Some of these provide warranties in addition to the warranty provided herein. In all such cases, a copy of that warranty will be provided with the product. To the extent protection provided under any such third party warranty exceeds the Limited Warranty provided herein, the Customer will have to look to that manufacturer for the additional warranty protection.