



## pH6000 Series Controllers

VOLFRAM offers The pH6000 series provides reliable, flexible and powerful control for your water treatment program.

### Features

- ✦ Large touchscreen display with icon based programming makes setup easy
- ✦ Universal sensor input provides extraordinary flexibility; the same controller can be used with almost any type of sensor needed
- ✦ Combination Sensor Input and Analog Input board that add even more flexibility Lead/Lag control of up to 6 relays
- ✦ Optional dual analog (4-20 mA) input for Fluorometers or nearly any other process value Multiple language support allows simple setup no matter where your business takes you Six control outputs allow the controller to be used in more applications
- ✦ Economical wall-mount package for easy installation
- ✦ On-screen and web page graphing of sensor values and control output status
- ✦ Two Virtual Inputs that are calculated from two real inputs (cycles of concentration, % rejection, etc.) Complete flexibility in the function of each relay
- ✦ Datalogging
- ✦ Emailing Alarm messages, Datalog reports or System Summary reports
- ✦ Ethernet option for remote access via the Internet, LAN or Modbus/TCP

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## Inputs

### Power

100-240 VAC, 50 or 60 Hz, 7A max Fuse: 6.3 Amp

### Sensor Input Signals (0, 1 or 2 depending on model code)

Contacting Conductivity: 0.01, 0.1, 1.0, or 10.0 cell constant, or

Electrodeless Conductivity (not available on the combination sensor/analog input card) or Disinfection or

Amplified pH or ORP which requires a preamplified signal. Volfram VEL or VDS series recommended.  $\pm 5$ VDC power available for external preamps.

Each sensor input card contains a temperature input. Temperature: 100 or 1000 ohm RTD, 10K or 100K Thermistor

### Analog (4-20 mA) Sensor Input (0, 1, 2 or 4 depending on model code)

2-wire loop powered and self-powered transmitters supported 3-wire and 4-wire transmitters supported

Each dual sensor input board has two channels: Channel 1, 130 ohm input resistance and Channel 2, 280 ohm input resistance. The combination input board has one channel, 280 ohm input resistance.

Available Power: One independent isolated 24 VDC  $\pm 15\%$  supply per channel. 1.5 W maximum for each channel. 2W (83 mA at 24 VDC) total power consumption for all channels (four total channels possible if two dual boards are installed; 2W is equivalent to 2 Little Dipper sensors)

### Digital Input Signals (6):

#### State-Type Digital Inputs

Electrical: Optically isolated and providing an electrically isolated 9V power with a nominal 2.3mA current when the digital input switch is closed. Typical response time: < 2 seconds. Devices supported: Any isolated dry contact (i.e. relay, reed switch). Types: Interlock

#### Low Speed Counter-Type Digital Inputs

Electrical: Optically isolated and providing an electrically isolated 9V power with a nominal 2.3mA current when the digital input switch is closed, 0-10 Hz, 50 msec minimum width. Devices supported: Any device with isolated open drain, open collector, transistor or reed switch.

Types: Contacting Flowmeter

#### High Speed Counter-Type Digital Inputs

Electrical: Optically isolated and providing an electrically isolated 9V power with a nominal 2.3mA current when the digital input switch is closed, 0-500 Hz, 1.00 msec minimum width. Devices supported: Any device with isolated open drain, open collector, transistor or reed switch. Types: Paddlewheel Flowmeter

# Outputs

## Powered Mechanical Relays (0 or 6 model code dependent)

Pre-powered on circuit board switching line voltage

All relays are fused together as one group, total current must not exceed 6A (resistive), 1/8 HP (93W)

## Dry Contact Mechanical Relays (0, 2 or 4 model code dependent)

6 A (resistive), 1/8 HP (93W)

Dry contact relays are not fuse protected.

## Pulse Outputs (0, 2 or 4 model code dependent)

Opto-isolated, solid-state relay, 200mA, 40V DC

VLOWMAX = 0.05V @ 18mA

## 4 - 20 mA (0 or 2 model code dependent)

Internally powered, Fully isolated

600 Ohm max resistive load, Resolution 0.0015% of span Accuracy ± 0.5% of reading

## Measurement Performance

	Range	Resolution	Accuracy
0.01 Cell Contacting Conductivity	0-300 $\mu$ S/cm	0.01 $\mu$ S/cm, 0.0001 mS/cm, 0.001 mS/m, 0.0001 S/m, 0.01 ppm	±1% of reading
0.1 Cell Contacting Conductivity	0-3,000 $\mu$ S/cm	0.1 $\mu$ S/cm, 0.0001 mS/cm, 0.01 mS/m, 0.0001 S/m, 0.1 ppm	±1% of reading
1.0 Cell Contacting Conductivity	0-30,000 $\mu$ S/cm	1 $\mu$ S/cm, 0.001 mS/cm, 0.1 mS/m, 0.0001 S/m, 1 ppm	±1% of reading
10.0 Cell Contacting Conductivity	0-300,000 $\mu$ S/cm	10 $\mu$ S/cm, 0.01 mS/cm, 1 mS/m, 0.001 S/m, 10 ppm	±1% of reading
pH	-2 to 16 pH units	0.01 pH units	±0.01% of reading
ORP	-1500 to 1500 mV	0.1 mV	±1 mV
Disinfection sensors	-2000 to 1500 mV	0.1 mV	±1 mV
	0 - 2 ppm to 0 - 20,000 ppm	Varies with range and slope	Varies with range and slope
Electrodeless Conductivity	500 - 12,000 $\mu$ S/cm	1 $\mu$ S/cm, 0.01 mS/cm, 0.1 mS/m, 0.001 S/m, 1 ppm	±1% of reading
	3,000-40,000 $\mu$ S/cm	1 $\mu$ S/cm, 0.01 mS/cm, 0.1 mS/m, 0.001 S/m, 1 ppm	±1% of reading
	10,000-150,000 $\mu$ S/cm	10 $\mu$ S/cm, 0.1 mS/cm, 1 mS/m, 0.01 S/m, 10 ppm	±1% of reading
	50,000-500,000 $\mu$ S/cm	10 $\mu$ S/cm, 0.1 mS/cm, 1 mS/m, 0.01 S/m, 10 ppm	±1% of reading
	200,000-2,000,000 $\mu$ S/cm	100 $\mu$ S/cm, 0.1 mS/cm, 1 mS/m, 0.1 S/m, 100 ppm	±1% of reading
Temperature	23 to 500°F (-5 to 260°C)	0.1°F (0.1°C)	±1% of reading within range

Temperature°C	Range Multiplier%
0	181.3
10	139.9
15	124.2
20	111.1
25	100.0
30	90.6
35	82.5
40	75.5
50	64.3
60	55.6
70	48.9

Temperature°C	Range Multiplier%
80	43.5
90	39.2
100	35.7
110	32.8
120	30.4
130	28.5
140	26.9
150	25.5
160	24.4
170	23.6
180	22.9



Note: Conductivity ranges above apply at 25°C. At higher temperatures, the range is reduced per the range multiplier chart.

## Sensor Details

Volfram's VEL Series electrodes are cost-effective pH and ORP electrodes for industrial applications. They are modular in design with a rugged CPVC housing that contains the electronics. pH and ORP cartridges can easily be connected or replaced in minutes without tools. The cartridges feature a unique threaded interlock connection and a double o-ring seal, ensuring a watertight fit and secure seating at all times.

The optional differential preamplifier and temperature compensation element are in the housing, and are not thrown away when the electrode needs replacement. The electrode is powered by

the controller it is connected to, so the signal is always preamplified and there are no batteries to go dead. A titanium solution ground rod integral to the housing enables the differential measuring technique. This results in prolonged electrode life and reliable measurement, resistance to stray voltages and currents or ground loop problems.

## Features

- Replaceable salt bridge for long life
- Field proven differential design
- Volfram preamplifier models are compatible with Volfram controllers
- Conventional preamplifier models are compatible with GLI and Aquamatrix (Lisle Metrix) controllers
- Resistant to ground loop problems

## Specifications

pH/ORP Electrode	
Range	0 to 14 pH (0 to 12 without sodium ion error $\pm 1999$ mV (ORP))
Response	95% in less than 5 seconds
Operating Pressure	100 psig
Cartridge Impedance	Not to exceed 1000M $\Omega$ over temp range
Housing Impedance	Preamplified versions - 100 $\Omega$ Non-preamplified versions - not to exceed 1000M $\Omega$ over temp range

### Measurement Performance

Range: 0 to 14 pH, -2000 to 2000 mV (ORP) Sensitivity: 0.001 pH, 0.1 mV

Stability: 0.03 pH per day, non-cumulative, 2 mV per day, non-cumulative Temperature: -5 to 95°C (23 to 203°F)

### Wetted Materials:

CPVC, Ceramic, Glass, EPDM, Platinum (ORP only) and Titanium Palladium alloy

Cable (Volfram preamp) 3 twisted pair shielded

Cable (Conv. preamp) 5 conductor shielded

Cable length 4.6 meters (15 ft)

Maximum cable length 900 meters (1,000 ft)

Temperature Limit -5 to 95°C (23 to 203°F)

Pressure Limit 0.7 MPa (100 PSI)

@65°C (149°F)



## Chemical Dozing System

Automated Dozing System compatible for volfram pH6000 for pH correction, by dozing caustic / acid

## Microflow Control Valve

Microflow control valve is design to doze caustic / acid for pH coercion based on the feedback from Volfram controller



## Micro Motion Flow Meter

Micro motion flow meter is designed to measure the flow off high pH liquids / slurry



Non Return Valve



Pressure & Temp Sensor



Auto Boiler  
Blow down System



Pressure Gauge