

# pH/ORP Controllers



## WPH/WDP400 Series

The WPH/WDP400 Series pH/ORP on-line process controllers are designed for a broad range of industrial, commercial, and municipal water treatment applications. WPH/WDP controllers are easily configured to accurately measure pH or mV (ORP) values from Walchem's WEL and WDS differential combination electrodes, or any conventional combination electrode.

A versatile output configuration allows you to program up to four outputs in a variety of control modes. Select from on/off mechanical relays or pulse proportional control for direct connection to metering pumps. The easy-to-use menu format and pre-wired, pre-mounted panel system options make set-up and installation quick and simple.

Integrated datalogging is available to validate system performance. A USB memory stick is all that's needed to extract data and event logs that include electrode measurements, temperature and relay status. Download log files from the USB stick to a PC at your convenience. It couldn't be easier!



### Summary of Key Benefits

- **Dual Input Reduces Cost**  
Dual pH or ORP electrode inputs allow one controller to take the place of two, reducing cost and space requirements, and simplifying installation.
- **Versatility for a Broad Range of Applications**  
Select from pH or ORP measurements and from five output options. Use *In-Range* to control a solenoid valve to dump a batch treatment tank when measurement value is within limits, or program for *Out-of-Range Alarm* in waste treatment applications when the measurement value is too high or low.
- **Ideal for Harsh Environments**  
The NEMA 4X enclosure, combined with Walchem's WEL and WDS electrodes, provides a waterproof system with no BNC connectors exposed to wet or corrosive environments.
- **Built-in Safety Features**  
Programmable output limit timers prevent run-away chemical addition. Digital Interlock Input may be used from a flow switch or level input to prevent chemical addition based on a stagnant sample, or control of an empty batch tank.
- **Simple, Integrated Data Collection**  
Download stored data from the controller to a USB stick with the press of a button. Use the data to simply and easily validate system performance, document compliance, and reduce liability. The data and event logs show pH/ORP and temperature values, as well as accumulated chemical feed and relay activation times.

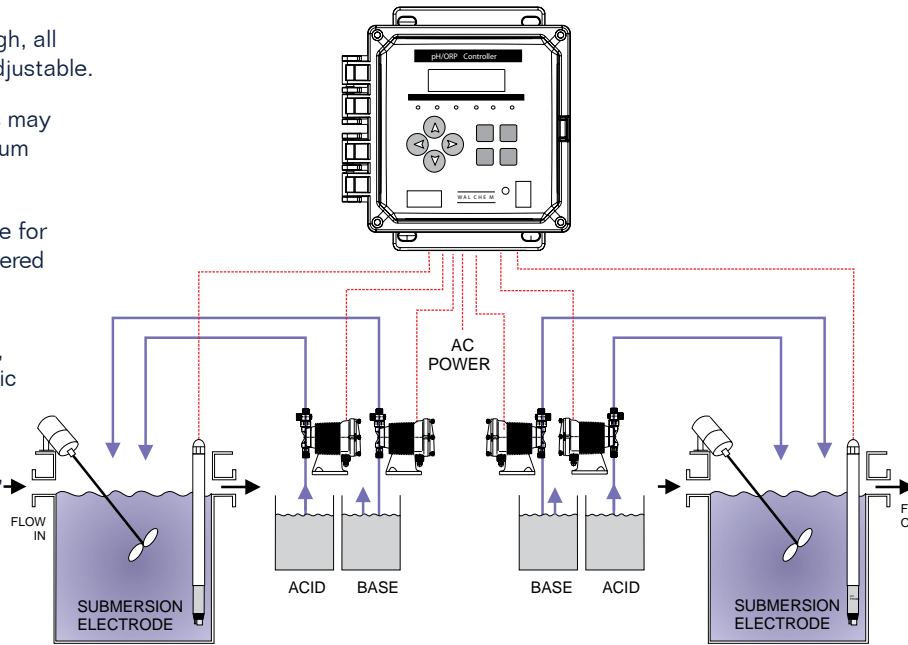


**W A L C H E M**

IWAKI America Inc.

# Features

- » **WPH410 Series** 4 control relays may be set as all high, all low or any combination. The control deadband is fully adjustable.
- » **WPH420 Series** 2 pulse proportional control outputs may be set independently, enhanced by an adjustable minimum and maximum pulse per minute setting.
- » **WDP410 Series** 4 powered relay outputs configurable for on/off control, alarms or automatic probe wash and 1 powered dedicated diagnostic alarm relay
- » **WDP420 Series** 2 pulse proportional control outputs, 2 dry contact relay outputs for on/off, alarm or automatic probe wash and 1 dedicated dry contact alarm relay
- » **WDP440 Series** 4 pulse proportional control outputs, and 1 dedicated dry contact diagnostic alarm relay



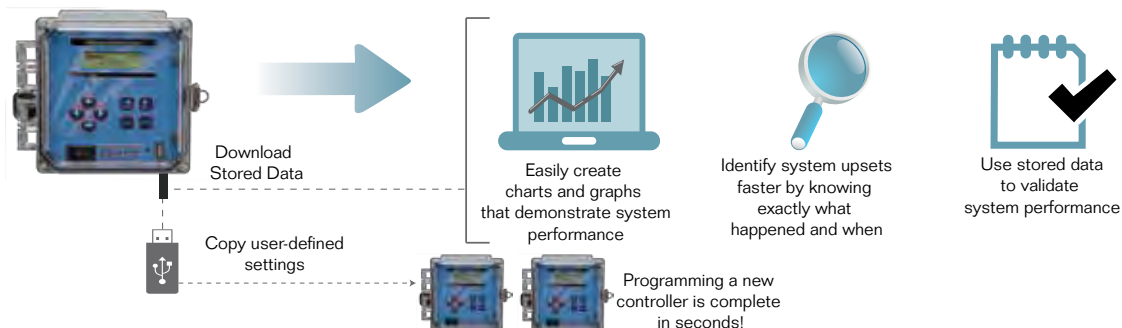
## Standard Features

- » **pH or ORP Measurement**
  - Configurable via a software menu setting.
  - Reduces inventory requirements.
- » **Versatile relay configuration**
  - Control outputs can be set as high or low set points via keypad. Auxiliary outputs can be set as:
    - High alarm
    - Low alarm
    - In-range output
    - Out-of-range alarm
    - Probe wash
- » **Probe wash feature**
  - For applications that require frequent electrode cleaning, automatic probe wash stretches out reliable measurement life between maintenance interruptions.
- » **4-20mA Outputs**
  - Internally powered and fully isolated, for connection to WebAlert, PLC or other devices.
- » **Self diagnostics**
  - Software and electronics are constantly monitored without having to take the controller off-line.
- » **Auto buffer recognition**
  - Software selectable for U.S. or European calibration standards.
- » **Self test**
  - Menu selectable self-test simulates pH and temperature signals, allowing for quick diagnostics of sensor or controller problems.
- » **Differential pH**
  - WDP and WPH Series controllers are a perfect match with Walchem's WEL pH/ORP sensors - offering an extremely reliable differential measurement technique immune to any possible ground loop problems. Together, they provide a true NEMA 4X system with no BNC connector exposed to wet or corrosive conditions. WEL pH/ORP electrodes are easily removed and replaced without any tools.

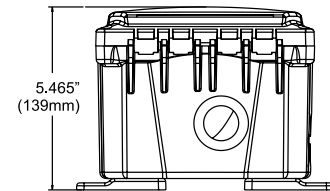
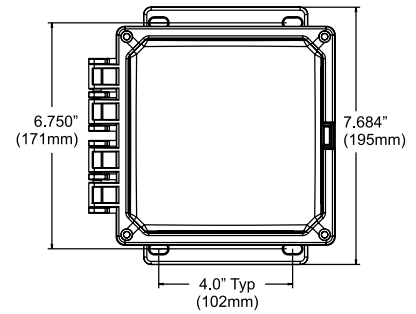
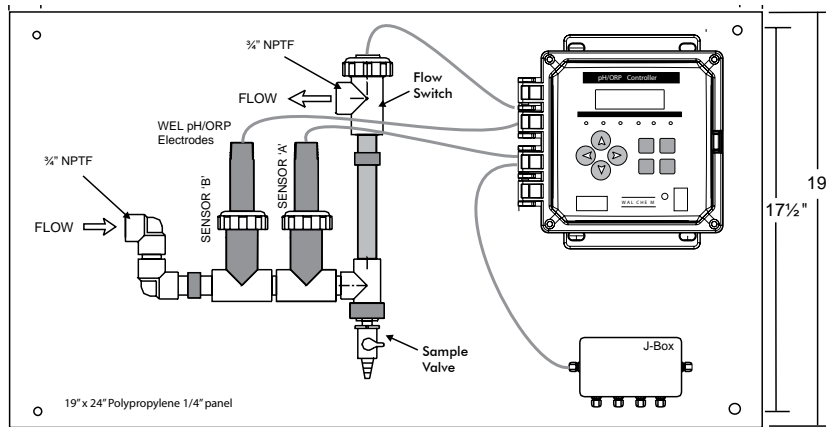


## USB Features

Integrated datalogging collects analytical measurements at 10 minute intervals and captures all relay activations.

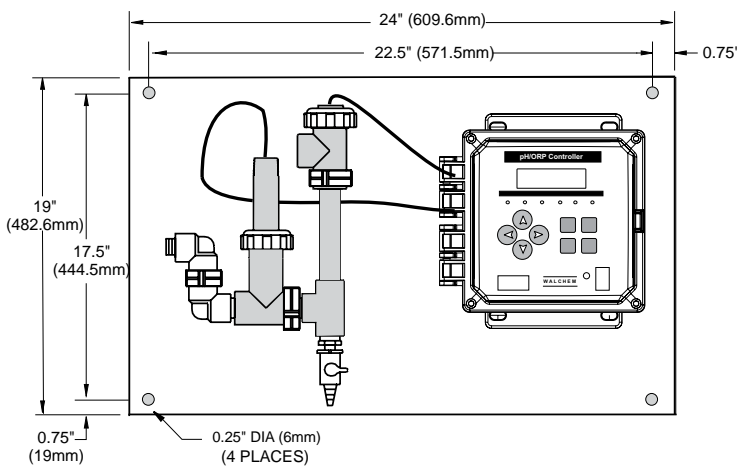


# Specifications



## Mechanical (controller)

<b>Enclosure</b>	Polycarbonate
<b>NEMA Rating</b>	NEMA 4X (IP65)
<b>Display</b>	2 x 16 character backlit liquid crystal
<b>Ambient Temperature</b>	32 to 122°F (0 to 50°C)
<b>Shipping weight</b>	22 lbs (10 kg) (approximately)



## Measurement Performance

	Range	Resolution	Accuracy (Calibrated)
pH/ORP	-2 to 16 pH ±1500 mV (ORP)	0.0015 pH units (.01 pH displayed) 92 µV (1 mV displayed) (ORP)	± 0.01 pH ± 1 mV (ORP)
Temperature	32 to 212°F (0 to 100°C)	±0.09°F (0.5°C)	±0.9°F (0.5°C)

## Inputs

**Power** 100-240 VAC, 50/60 Hz, 8A  
Fuse: 1.0 ampere, 5 x 20 mm

**Signals** One each for WPH, Two for WDP  
pH/ORP: ±1500 mV

Temperature compensation (optional, pH only):  
Pt100 or Pt1000

Interlock (optional):  
Isolated, dry contact closure required (i.e. flow, level, etc.)

## WEL pH/ORP Electrode (optional)

**Temperature Range** 50 to 158°F (10 to 70°C)  
**Operating Pressure** 0 to 100 psi

### Materials of construction

Electrode body	CPVC
Electrode reference	HDPE
O-rings	FKM
Electrode	Glass (pH) Platinum (ORP)
Optional ground rod	Titanium
1" NPTM pipe submersion connection	
3/4" threaded NPTF tee in-line connection	

## Outputs

**Powered Relays** Internally powered relays switching line voltage  
6A (resistive), 1/8 HP  
All relays are fused together as one group, total current for this group must not exceed 6A

**Pulse Outputs** Opto-isolated, Solid state relay  
150 mA, 40 VDC Max.  
VLOWMAX = .13V @ 18 mA

**Dry contact relays** 6 A (resistive), 1/8 HP  
Dry contact relays are not fuse protected

	CTRL1	CTRL2	CTRL3	CTRL4	ALARM
WPH410	Powered		Dry		
WDP410	Powered				
WPH/DP420	Pulse		Dry		
WDP440	Pulse				Dry

**4 - 20 mA 1 or 2 (optional)** Internally powered  
Fully isolated  
600 Ohm max resistive load  
Resolution .001% of span  
Accuracy ± 1% of reading

# Ordering Information

WPH4  0 —      U  
control voltage output options USB

## CONTROL

- 1 = WPH: 2 powered on/off relays & 2 on/off dry contact relays & 1 dry contact dedicated alarm  
WDP: 4 powered on/off relays & 1 powered dedicated alarm relay
- 2 = WPH & WDP: 2 pulse proportional relays & 2 on/off dry contact relays & 1 dry contact dedicated alarm
- 4 = WDP: 4 pulse proportional outputs & 1 dry contact dedicated alarm

## VOLTAGE

- 1 = WPH/WDP410: 120 VAC, prewired, 6" pigtailed to powered relays  
WPH/WDP420, WDP440: 20 ft. cables for E Class pumps
- 3 = WPH420: 120 VAC, prewired, 20 ft. cables with connectors for EW pumps
- 5 = Hardwired, cable glands

## OUTPUT

- N = No data output
- 4 = Single isolated 4-20 mA output
- 2 = Two 4-20 mA outputs

## WPH OPTIONS

- 1 = Prewired preamp with 10 ft. cable (electrode not included. Electrode should have BNC connector)
- 2 = Submersion flat pH electrode w/integral preamp (WEL-PHF-21)
- 3 = In-line flat pH electrode w/integral preamp (WEL-PHF-22) includes 3/4" NPTF mounting tee
- 4 = In-line flat pH electrode w/integral preamp (WEL-PHF-22) includes 3/4" flow switch manifold & 'U' adapter mounted on polypro panel
- 4T= In-line flat pH electrode with ATC and integral preamp (WEL-PHF-12), 3/4" flow switch manifold & 'U' adapter mounted on polypro panel
- 5 = Submersion ORP electrode w/integral preamp (WEL-MVF-21)
- 6 = In-line ORP electrode w/integral preamp (WEL-MVF-22), includes 3/4" NPTF mounting tee
- 6R= In-line rod style ORP electrode w/integral preamp (WEL-MVR-22), includes 3/4" NPTF mounting tee
- 7 = In-line ORP electrode w/integral preamp (WEL-MVF-22), 3/4" flow switch manifold and 'U' adapter mounted on polypro panel
- 7R= In-line rod style ORP electrode w / integral preamp (WEL-MVR-22), 3/4" flow switch manifold and 'U' adapter mounted on polypro panel

## WDP OPTIONS

- 2 = 2 WEL submersion style flat pH electrodes (without auto temp comp)
- 5 = 2 WEL submersion style ORP electrode
- 6 = 1 WEL submersion style flat pH electrode (without auto temp comp) & 1 WEL submersion ORP electrode
- 7 = 1 WEL in-line style flat pH electrode (without auto temp comp, tee included) & 1 WEL in-line ORP electrode (tee included)
- 8 = Flow switch manifold with 2 WEL in-line electrodes; 1 pH (without auto temp comp) & 1 ORP mounted on 19" x 24" polypropylene panel
- 8T= Identical to option #8 above, with auto temp comp

## USB FEATURES

- U = Integrated datalogging, event/reset logging, and configuration file import/export



## Metering Pumps

The E-Class is the most innovative and comprehensive metering pump product line in the world. Over 50 years of pump experience and a commitment to superior mechanical design has led to development of many industry firsts, including 360 stroke-per-minute technology, IP67 waterproof construction, and the world's highest capacity solenoid metering pumps.



## WIND WebMaster® Industrial Water Controllers

Walchem's WebMaster Industrial (WIND) Controller sets a new standard for Industrial Water Treatment Controllers. WIND has a flexible multi-I/O platform, a wide range of analytical sensor measurement capabilities, and an extensive assortment of integrated communications and data handling features.

## Agency Certifications

- Safety UL 61010-1:2012 3rd Ed.  
CSA C22.2 No. 61010-1:2012 3rd Ed.  
IEC 61010-1:2010 3rd Ed.  
EN 61010-1:2010 3rd Ed.
- EMC IEC 61326-1:2005  
EN 61326-1:2006

Note: For EN61000-4-6 & EN61000-4-3 the controller met performance criteria B.

\*Class A equipment: Equipment suitable for use in establishments other than domestic, and those directly connected to a low voltage (100-240 VAC) power supply network which supplies buildings used for domestic purposes.



## ABOUT US

Walchem integrates its advanced sensing, instrumentation, fluid pumping and communications technologies to deliver reliable and innovative solutions to the global water treatment market. Our in-house engineering is driven by quality, technology and innovation. For more information on the entire Walchem product line, visit: [www.walchem.com](http://www.walchem.com)

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