

# Conductivity, pH/ORP & Disinfection

## W100W Series Controllers

The W100W series provide an economical and reliable way to keep your water treatment program under control.

### Summary of Key Benefits

- Large 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
- Three pH/ORP models available for use with amplified electrodes, non-amplified electrodes with a BNC connector or non-amplified electrodes without a connector
- Multiple language support allows simple setup no matter where your business takes you
- Three control outputs allow the controller to be used in more places than other entry level models
- Economical wall-mount package for easy installation
- Complete flexibility in the function of each relay
  - On/Off Setpoint
  - Time Proportional Control
  - Pulse Proportional Control (when purchased with solid-state relays)
  - In-range or Out-of-range activation
  - Timer-based activation
  - Activation based upon the state of a contact closure
  - Timed activation triggered by a Water Contactor or Paddlewheel flow meter's accumulated total flow
  - Activate with another output
  - Alarm

### Typical Applications

- Wastewater neutralization & disinfection
- Food and Beverage disinfection
- Potable water treatment
- Swimming pools & spas
- Cooling tower biocide control
- Metal finishing & printed circuit board
- Irrigation & fertigation
- RO Systems



**W A L C H E M**

IWAKI America Inc.

# Specifications

## Measurement Performance

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

Temperature °C	0	10	15	20	25	30	35	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
Range Multiplier %	181.3	139.9	124.2	111.1	100.0	90.6	82.5	75.5	64.3	55.6	48.9	43.5	39.2	35.7	32.8	30.4	28.5	26.9	25.5	24.4	23.6	22.9

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

## Inputs

### Power

100-240 VAC, 50 or 60 Hz, 7A max

Fuse: 6.3 Amp

### Digital Input Signals (2)

#### State-Type

**Electrical:** Optically-isolated input.  
Provides isolated 9V power.  
Current consumption when input is closed: 2.3 mA nominal.

**Typical response time:** <2 seconds

**Devices supported:** Any isolated dry contact (i.e. relay, reed switch)

**Types:** Interlock

#### Low Speed Counter-Type

**Electrical:** Optically-isolated input.  
Provides isolated 9V power.  
Current consumption when input is closed: 2.3 mA nominal.  
0-10Hz, 50 msec minimum pulse width

**Devices supported:** Any device with isolated open drain, open collector, transistor or reed switch

**Types:** Contacting Flowmeter

#### High-Speed Counter-Type

**Electrical:** Optically-isolated input.  
Provides isolated 9V power.  
Current consumption when input is closed: 2.3 mA nominal.  
0-250Hz, 1.25 msec minimum pulse width

**Devices supported:** Any device with isolated open drain, open collector, transistor or reed switch

**Types:** Paddlewheel Flowmeter

## Outputs

### Powered Mechanical Relays (0 or 3 model code dependent)

Pre-powered on circuit board switching line voltage

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

All three relays are fused together as one group, total current for this group must not exceed 6A.

### Dry Contact Mechanical Relays (0, 1 or 3 model code dependent)

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

Dry contact relays are not fuse protected.

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

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

VLOWMAX = 0.05V @ 18mA

### 4 - 20 mA (0 or 1 model code dependent)

Internally powered, Fully isolated

600 Ohm max resistive load

Resolution 0.0015% of span, Accuracy  $\pm 0.5\%$  of reading

## Mechanical (Controller)

### Enclosure

Polycarbonate

### Enclosure Rating

NEMA 4X (IP65)

### Display

128 x 64 graphic backlit display

### Ambient. Temperature

-4 to 131°F (-20 to 55°C)

### Shipping Temperature

-4 to 176°F (-20 to 80°C)

### Shipping weight

26 lbs (11.8 kg) (approximately)  
varies with model

## Agency Certifications

### Safety:

UL 61010-1:2012, 3rd Edition

CSA C22.2 No.61010-1:2012, 3rd Edition

IEC 61010-1:2010 3rd Edition

EN 61010-1:2010 3rd Edition

### EMC:

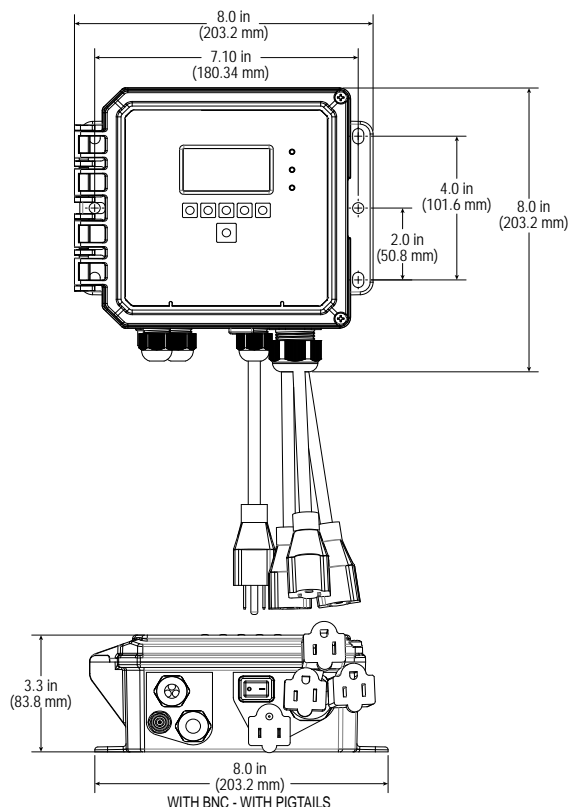
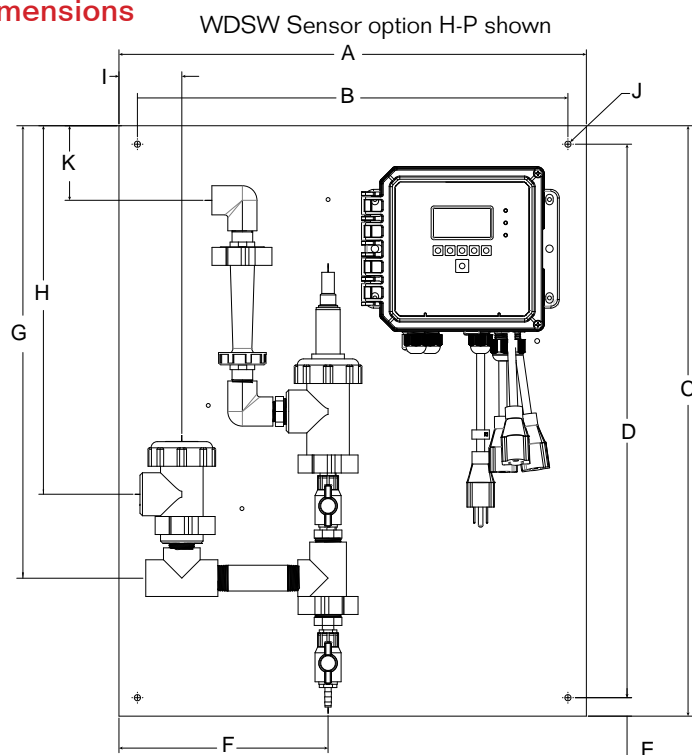
IEC 61326-1:2005

EN 61326-1:2006

Note: For EN61000-4-6, EN61000-4-3 the controller met performance criteria B. This equipment is 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.

# Specifications

## Dimensions



## Panel Mounted Flow Switch Manifold Dimensions

	A	B	C	D	E	F	G	H	I	J	K
WPHPW sensor options F, J or K	22.5 in 571.5mm	21.5 in 546.1mm	11.8 in 299.7mm	10.8 in 274.3mm	0.50 in 12.7mm	8.0 in 203.2mm	4.3 in 109.2mm	1.8 in 45.7mm	5.0 in 127.0mm	0.25 in 6.35mm	N/A
WCNW sensor option E	19.0 in 482.6mm	17.5 in 444.5mm	24.0 in 609.6mm	22.5 in 571.5mm	0.8 in 20.3mm	8.3 in 210.8mm	18.2 in 462.3mm	10.1 in 256.5mm	3.7 in 94.0mm		
WDSW sensor options H - P					0.75 in 19.05mm	8.5 in 215.9mm	18.4 in 467.1mm	15.0 in 381.0mm	2.6 in 66.0mm		

## Mechanical (Sensors)

Sensor	Pressure	Temperature	Materials	Process Connections
Electrodeless conductivity	0-140 psi (0 to 9.6 bar)	CPVC: 20-180°F (-5 to 80°C) PEEK: 20-190°F (-5 to 88°C)	CPVC, FKM in-line o-ring PEEK, 316 SS in-line adapter	1" NPTM submersion 2" NPTM in-line adapter
pH	0-100 psi (0 to 6.9 bar)	50-158°F (10-70°C)	CPVC, Glass, FKM o-rings, HDPE, Titanium rod, glass-filled PP tee	1" NPTM submersion
ORP	0-100 psi (0 to 6.9 bar)	32-158°F (0-70°C)		3/4" NPTF in-line tee
Contacting conductivity	0-200 psi (0 to 13.8 bar)	32-248°F (0-120°C)		3/4" NPTM
Free Chlorine/Bromine	0-14.7 psi (0 to 1.0 bar)	32-113°F (0-45°C)	PVC, Polycarbonate, silicone rubber, SS, PEEK, FKM, Isoplast	1/4" NPTF Inlet 3/4" NPTF Outlet
Extended pH Range Free Chlorine/Bromine	0-14.7 psi (0 to 1.0 bar)	32-113°F (0-45°C)		
Total Chlorine	0-14.7 psi (0 to 1.0 bar)	32-113°F (0-45°C)		
Chlorine Dioxide	0-14.7 psi (0 to 1.0 bar)	32-131°F (0-55°C)		
Ozone	0-14.7 psi (0 to 1.0 bar)	32-131°F (0-55°C)		
Peracetic Acid	0-14.7 psi (0 to 1.0 bar)	32-131°F (0-55°C)		
Hydrogen Peroxide	0-14.7 psi (0 to 1.0 bar)	32-113°F (0-45°C)	GFRPP, PVC, FKM, Isoplast	3/4" NPTF
Flow switch manifold	0-150 psi (0 to 10.3 bar) up to 100°F (38°C) 0-50 psi (0 to 3.4 bar) at 140°F (60°C)	32-140°F (0-60°C)		

# Ordering Information

**WCNW** (Contacting or Electrodeless Conductivity Sensors)  
**WPHPW** (Amplified pH/ORP Electrodes)  
**WPHBW** (Non-Amplified pH/ORP Electrodes with BNC)  
**WPHNW** (Non-Amplified pH/ORP Electrodes with bare wires)  
**WDSW** (Disinfection Sensors)

## Relays/Wiring

100H = 3 powered relays, hardwired  
 100P = 3 powered relays, prewired USA power cord & pigtails  
 100D = 3 powered relays, prewired DIN power cord, no pigtails  
 110H = 3 dry relays, hardwired  
 110P = 3 dry relays, prewired USA power cord, no pigtails  
 110D = 3 dry relays, prewired DIN power cord, no pigtails  
 120H = 2 pulse, 1 dry relay, hardwired  
 120P = 2 pulse, 1 dry relay, prewired with USA power cord, no pigtails  
 120D = 2 pulse, 1 dry relay, prewired with DIN power cord, no pigtails

## Analog Output

N = No analog output  
 A = One isolated analog (4-20 ma) output

## Sensors (WCNW)

N = No sensor  
 A = Submersion PEEK electrodeless conductivity, 20 ft cable  
 B = Submersion CPVC electrodeless conductivity, 20 ft cable  
 C = Inline PEEK electrodeless conductivity, 20 ft cable  
 D = Inline CPVC electrodeless conductivity, 20 ft cable  
 E = Inline CPVC electrodeless conductivity w/FS manifold on panel, 3 ft cable  
 F = Contacting conductivity, 1.0 cell constant, 100 psi, 10 ft cable  
 G = Contacting conductivity, 0.1 cell constant, 100 psi, 10 ft cable  
 H = Contacting conductivity, 10.0 cell constant, 100 psi, 10 ft cable  
 I = Contacting conductivity, 0.01 cell constant, 100 psi, 10 ft cable  
 J = Contacting conductivity, 1.0 cell constant, 200 psi, 10 ft cable  
 K = Contacting conductivity, 0.1 cell constant, 200 psi, 10 ft cable  
 L = Contacting conductivity, 10.0 cell constant, 200 psi, 10 ft cable  
 M = Contacting conductivity, 0.01 cell constant, 200 psi, 10 ft cable

## Sensors (WPHPW)

N = No sensor  
 A = External preamp, 20 ft cable  
 B = Submersion pH, no ATC, 20 ft cable  
 C = Submersion pH, with ATC, 20 ft cable  
 D = Inline pH, no ATC, 20 ft cable  
 E = Inline pH, with ATC, 20 ft cable  
 F = Inline pH, with ATC, with FS manifold on panel, 3 ft cable  
 G = Submersion flat ORP, 20 ft cable  
 H = Inline flat ORP, 20 ft cable  
 I = Inline Rod-Style ORP, 20 ft cable  
 J = Inline flat ORP with FS manifold on panel, 3 ft cable  
 K = Inline Rod Style ORP w/ FS manifold on panel, 3 ft cable

Relays/Wiring

Analog Output

Sensors

## Sensors (WDSW)

N = No sensor  
 A = Free chlorine, 0-20 ppm, 20 ft cable  
 B = ClO<sub>2</sub>, 0-20 ppm, 20 ft cable  
 C = Ozone, 0-10 ppm, 20 ft cable  
 D = PAA, 0-2000 ppm, 20 ft cable  
 E = Extended pH range free chlorine, 0-20 ppm, 20 ft cable  
 F = Total chlorine, 0-20 ppm, 20 ft cable  
 G = Peroxide, 0-2000 ppm, 20 ft cable  
 H = Free chlorine with manifold on panel, 0-20 ppm, 3 ft cable  
 I = ClO<sub>2</sub> with manifold on panel, 0-20 ppm, 3 ft cable  
 J = Ozone with manifold on panel, 0-10 ppm, 3 ft cable  
 K = PAA with manifold on panel, 0-2000 ppm, 3 ft cable  
 L = Extended pH range Cl<sub>2</sub> with manifold on panel, 0-20 ppm, 3 ft cable  
 M = Total chlorine with manifold on panel, 0-20 ppm, 3 ft cable  
 O = Peroxide with manifold on panel, 0-2000 ppm, 3 ft cable  
 P = No sensor with manifold on panel, 3 ft cable

## Sensors (WPHBW or WPHNW)

N = No sensor

## 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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