

# Conductivity, pH/ORP & Disinfection

## NEW!! W600 Series Controllers

The W600 series provides reliable, flexible and powerful control for your water treatment program.

### Summary of Key Benefits

- 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
- 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 graphing of sensor values and control output status
- 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
  - Probe wash
  - 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
  - Activate as a percent of another output's on-time
  - Alarm
  - Spike Set Point
  - For Cooling Tower and Boiler applications:
    - Biocide Timer
    - Boiler blowdown on conductivity using intermittent sampling
- Datalogging
- Emailing Alarm messages, Datalog reports or System Summary reports
- Ethernet option for remote access via the Internet or LAN



**W A L C H E M**

IWAKI America Inc.

# Specifications

## 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	$\pm$ 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	$\pm$ 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	$\pm$ 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	$\pm$ 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 $\mu$ S/cm	1 $\mu$ S/cm, 0.01 mS/cm, 0.1 mS/m, 0.001 S/m, 1 ppm	$\pm$ 1% of reading
	3,000-40,000 $\mu$ S/cm	1 $\mu$ S/cm, 0.01 mS/cm, 0.1 mS/m, 0.001 S/m, 1 ppm	$\pm$ 1% of reading
	10,000-150,000 $\mu$ S/cm	10 $\mu$ S/cm, 0.1 mS/cm, 1 mS/m, 0.01 S/m, 10 ppm	$\pm$ 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	$\pm$ 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	$\pm$ 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

### 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 or  
Disinfection or  
Amplified pH or ORP which requires a preamplified signal. Walchem  
WEL or WDS series recommended.  $\pm$ 5VDC 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, 2 or 4 depending on model code)

2-wire loop powered and self-powered transmitters supported  
3-wire and 4-wire transmitters supported  
Each sensor input board has two channels: Channel 1, 130 ohm input  
resistance and Channel 2, 280 ohm input resistance  
Available Power: Two independent isolated 24 VDC  $\pm$  15% supplies per  
board. 1.5 W maximum for each channel. 2W (83 mA at 24 VDC) total  
power consumption for all channels (four total channels if two 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, 1.25 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  $\pm$  0.5% of reading

## Mechanical (Controller)

### Enclosure Material

Polycarbonate

### Enclosure Rating

NEMA 4X (IP65)

### Dimensions

9.5 x 8 x 4" (241 x 203 x 102 mm)

### Display

320 x 240 pixel monochrome backlit  
display with touchscreen

### Ambient Temperature

-4 to 131°F (-20 to 55°C)

### Storage Temperature

-4 to 176°F (-20 to 80°C)

## 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

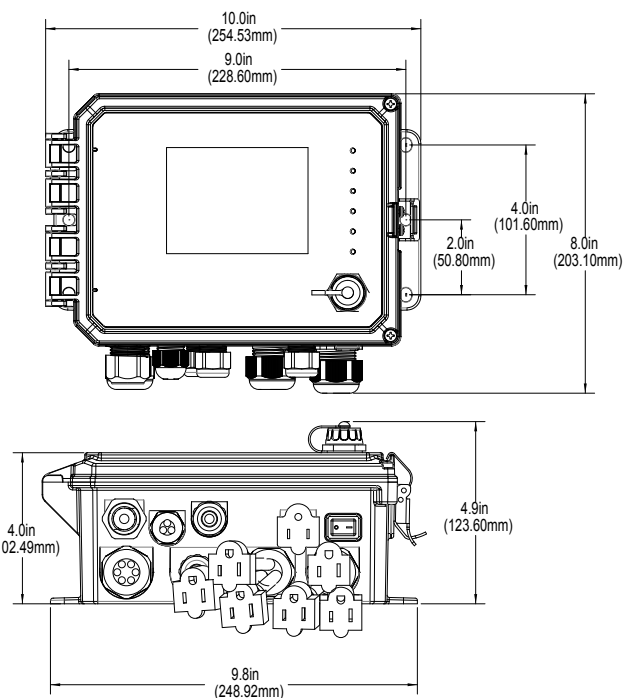
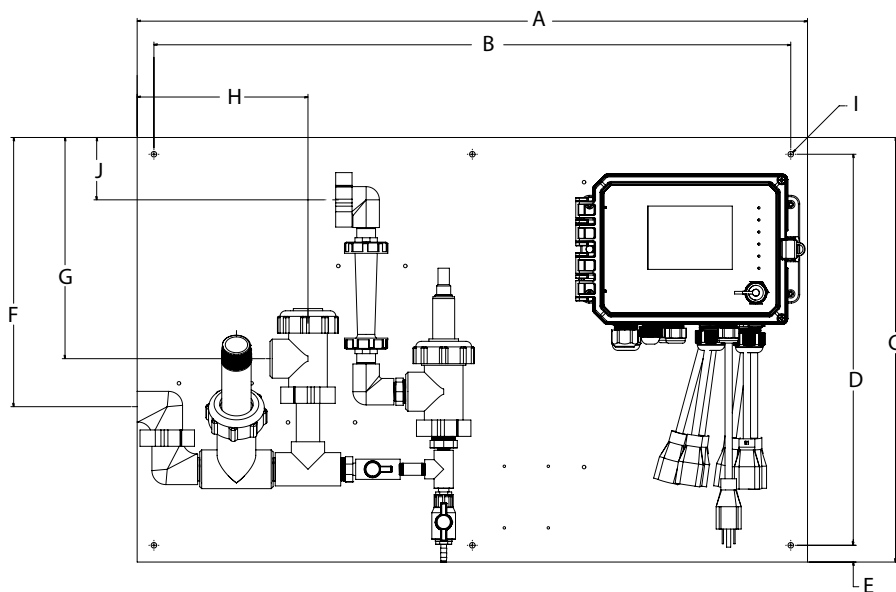
### EMC:

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

W600	A	B	C	D	E	F	G	H	I	J
Tolerances:	+/- 0.1", 2.5 mm					+/- 0.3", 8 mm			+/- 0.01", 0.25 mm	+/- 0.3", 8 mm
W600-CT-BN/FN	13", 330 mm	12", 305 mm	11.75", 298 mm	10.75", 273 mm	0.5", 12.7 mm	7", 178 mm	2", 51 mm	1.5", 38 mm	0.25", 6.35 mm	
W600-CT-BA/BB/ BC/BD/FA/FB/ FC/FD	22.5", 571 mm	21.5", 546 mm	11.75", 298 mm	10.75", 273 mm	0.5", 12.7 mm	4", 102 mm	1.5", 38 mm	11", 279 mm	0.25", 6.35 mm	
W600-CT-DN	22.5", 571 mm	21.5", 546 mm	11.75", 298 mm	10.75", 273 mm	0.5", 12.7 mm	7", 178 mm	7", 178 mm	10", 254 mm	0.25", 6.35 mm	
W600-CT-DE/DF	22.5", 571 mm	21.5", 546 mm	11.75", 298 mm	10.75", 273 mm	0.5", 12.7 mm	4", 102 mm	2", 51 mm	10", 254 mm	0.25", 6.35 mm	
W600-CT-HN	24", 610 mm	22.5", 571 mm	19", 483 mm	17.5", 445 mm	0.75", 19 mm	14", 356 mm	6", 152 mm	3", 76 mm	0.25", 6.35 mm	
W600-CT-HA	24", 610 mm	22.5", 571 mm	19", 483 mm	17.5", 445 mm	0.75", 19 mm	11", 279 mm	6", 152 mm	3", 76 mm	0.25", 6.35 mm	
W600-PH-PN/PX	22.5", 571 mm	21.5", 546 mm	11.75", 298 mm	10.75", 273 mm	0.5", 12.7 mm	4", 102 mm	1.5", 38 mm	11", 279 mm	0.25", 6.35 mm	
W600-PH-QN/QX	22.5", 571 mm	21.5", 546 mm	11.75", 298 mm	10.75", 273 mm	0.5", 12.7 mm	7", 178 mm	4", 102 mm	1.5", 38 mm	0.25", 6.35 mm	
W600-DS-PN	24", 610 mm	22.5", 571 mm	19", 483 mm	17.5", 445 mm	0.75", 19 mm	15", 381 mm	10", 254 mm	1.5", 38 mm	0.25", 6.35 mm	3", 76 mm
W600-DS-PX	30", 762 mm	28.5", 724 mm	19", 483 mm	17.5", 445 mm	0.75", 19 mm	12", 305 mm	10", 254 mm	8", 203 mm	0.25", 6.35 mm	3", 76 mm

## Mechanical (Sensors)

Sensor	Pressure	Temperature	Materials	Process Connections
Electrodeless conductivity	0-140 psi (0 to 9.6 bar)	CPVC: 32-158°F (0 to 70°C) PEEK: 32-190°F (0 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 3/4" NPTF in-line tee
ORP	0-100 psi (0 to 6.9 bar)	32-158°F (0-70°C)		
Contacting conductivity	0-200 psi (0 to 13.8 bar)	32-248°F (0-120°C)	316SS, PEEK	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)		
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)	GFRPP, PVC, FKM, Isoplast	3/4" NPTF

# Ordering Information

**WCT (Cooling Tower)**  
**WBL (Boiler)**  
**WPH (pH)**  
**WDS (Disinfection)**  
**WCN (Conductivity)**

Relays/Wiring

Input Cards

Analog Outputs

Ethernet

Sensors

## Relays/Wiring

600H 6 powered relays, Hardwired  
 600P 6 powered relays, Prewired with USA cords and pigtails  
 600D 6 powered relays, Prewired with DIN power cord, no pigtails  
 610H 2 powered 4 dry relays, Hardwired  
 610P 2 powered 4 dry relays, Prewired with USA cord and 2 pigtails  
 610D 2 powered 4 dry relays, Prewired with DIN power cord, no pigtails  
 620H 2 opto 4 dry relays, Hardwired  
 620P 2 opto 4 dry relays, Prewired with USA cord and two 20 ft. pulse cables  
 620D 2 opto 4 dry relays, Prewired with DIN power cord, no pigtails  
 640H 4 opto 2 dry relays, Hardwired  
 640P 4 opto 2 dry relays, Prewired with USA cord and four 20 ft. pulse cables  
 640D 4 opto 2 dry relays, Prewired with DIN power cord, no pigtails

## Input Cards

NN No sensor input cards  
 SN One sensor input card  
 SS Two sensor input cards  
 AN One dual analog input card  
 AA Two dual analog input cards  
 SA One sensor input card and one analog input card

## Analog Outputs

N No analog outputs  
 A One dual isolated analog output card

## Ethernet

N No Ethernet  
 E Ethernet card

## WCT Cooling Tower Sensors

NN No sensor  
 AN Inline graphite contacting conductivity  
 BN Graphite contacting conductivity + Flow Switch manifold on panel  
 CN High pressure contacting conductivity  
 DN High pressure contacting conductivity + Flow Switch manifold on panel  
 EN Inline 316SS contacting conductivity  
 FN 316SS contacting conductivity + Flow Switch manifold on panel  
 GN Inline electrodeless conductivity  
 HN Electrodeless conductivity + Flow Switch manifold on panel  
 BA Graphite contacting conductivity + Flow Switch manifold on panel + WEL-PHF no ATC  
 BB Graphite contacting conductivity + Flow Switch manifold on panel + WEL-MVR no ATC  
 BC Graphite contacting conductivity + Flow Switch manifold on panel + WEL-MVF no ATC  
 BD Graphite contacting conductivity + Flow Switch manifold on panel + LD  
 FA 316SS contacting conductivity + Flow Switch manifold on panel + WEL-PHF no ATC  
 FB 316SS contacting conductivity + Flow Switch manifold on panel + WEL-MVR no ATC  
 FC 316SS contacting conductivity + Flow Switch manifold on panel + WEL-MVF no ATC  
 FD 316SS contacting conductivity + Flow Switch manifold on panel + LD  
 DE High pressure contacting conductivity + Flow Switch manifold on panel + pH and 190783  
 DF High pressure contacting conductivity + Flow Switch manifold on panel + ORP and 190783  
 HA Electrodeless conductivity + Flow Switch manifold on panel + WEL-PHF no ATC  
 HB Electrodeless conductivity + Flow Switch manifold on panel + WEL-MVR no ATC  
 HC Electrodeless conductivity + Flow Switch manifold on panel + WEL-MVF no ATC  
 HD Electrodeless conductivity + Flow Switch manifold on panel + LD

## WBL Boiler Sensors

NN No sensor  
 AN Boiler sensor with ATC, 250 psi, 1.0 cell constant, 20 ft. cable  
 BN Boiler sensor without ATC, 250 psi, 1.0 cell constant, 20 ft. cable  
 CN Condensate sensor with ATC, 200 psi, 0.1 cell constant, 10 ft. cable  
 DN Boiler sensor with ATC, 250 psi, 10 cell constant, 20 ft. cable  
 AA Two K=1.0 boiler sensors with ATC, 250 psi, 20 ft. cables  
 BB Two K=1.0 boiler sensor without ATC, 250 psi, 20 ft. cables  
 CC Two K=0.1 condensate sensors with ATC, 200 psi, 10 ft. cables  
 DD Two K=10 Boiler sensors with ATC, 250 psi, 20 ft. cables  
 AB K=1.0 boiler sensor with ATC and K=1.0 boiler sensor without ATC, 250 psi, 20 ft. cables  
 AC K=1.0 boiler sensor with ATC, 20 ft. and K=0.1 condensate sensor with ATC, 250 psi, 10 ft. cable  
 AD K=1.0 boiler sensor with ATC and K=10 boiler sensor with ATC, 250 psi, 20 ft. cables  
 BC Boiler sensor without ATC, 20 ft. and condensate sensor with ATC, 10 ft. cable  
 BD Boiler sensor without ATC and K=10 boiler sensor with ATC, 250 psi, 20 ft. cables  
 CD Condensate sensor with ATC, 10 ft. cable and K=10 boiler sensor with ATC, 250 psi, 20 ft. cable

## WPH pH/ORP Sensors/Manifold

NN No sensors or flow switch manifold  
 PN Single low pressure manifold on panel\*\*  
 QN Single high pressure manifold on panel with 190783\*  
 PX Dual low pressure manifold on panel\*\*  
 QX Dual high pressure manifold on panel with two 190783\*  
 \*Order 102029 pH and/or 102963 ORP electrodes separately  
 \*\*Order WEL electrode(s) and preamplifier housing(s) separately

## WDIS Disinfection Sensors/Manifold

NN No sensors or flow switch manifold  
 PN Single DIS manifold on panel\*  
 PX DIS manifold plus pH/ORP/cooling tower cond tee on panel\*\*  
 FN Single DIS flow cell/cable, no sensor\*  
 FF Two DIS flow cell/cable, no sensors\*  
 \*Order disinfection sensor(s) separately  
 \*\*Order disinfection sensor and WEL electrode and preamplifier housing or cooling tower conductivity sensor separately

## WCN Conductivity Sensors

NN No sensors or flow switch manifold\*  
 \*Order conductivity sensor separately



**Cannon Water Technology Inc.**

233 Technology Way Suite 9, Rocklin, CA 95765

Voice: 1 916-315-2691, FAX: 1 916-304-0210

csd@cannonwater.com, <https://cannonwater.com/>

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180625.F Aug 2015

**IWAKI America Inc.**