Conductivity, pH/ORP & Disinfection

W900 Series Controllers

The W900 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
- Four I/O slots allow complete flexibility in adding additional sensors, analog inputs and analog outputs
- Multiple language support allows simple setup no matter where your business takes you
- Eight relay 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
- Complete flexibility in the function of each relay
  - On/Off Setpoint
  - Time Proportional Control
  - Pulse Proportional Control (when purchased with 4-20mA or pulse solid state opto outputs)
  - PID Control (when purchased with 4-20mA or pulse solid state opto outputs)
  - 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, LAN or Modbus/TCP

WALCHEM
IWAKI America Inc.

Specifications

Inputs

Power
100-240 VAC, 50 or 60 Hz, 13A max Fuse: 6.3 Amp

Sensor Input Signals (0-8 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. ±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 (0-24 depending on model code)
2-wire loop powered and self-powered transmitters supported
3-wire and 4-wire transmitters supported
All Channels fully isolated, input and power
Channel 1, 130 ohm input resistance, Channel 2-6, 280 ohm input resistance
Available Power: Isolated 24 VDC ±15% supply per channel. 1.5 W (62.5 mA maximum for each channel)

Digital Input Signals (12):
State-Type Digital Inputs
Electrical: Optically isolated and providing an electrically isolated 12V power with a nominal 2.5 mA 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: DI State

Low Speed Counter-Type Digital Inputs
Electrical: Optically isolated and providing an electrically isolated 12V power with a nominal 2.3 mA current when the digital input switch is closed, 0-20 Hz, 25 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 12V power with a nominal 2.3 mA current when the digital input switch is closed, 0-599 Hz, 1.0 msec minimum width. Devices supported: Any device with isolated open drain, open collector, transistor or reed switch. Types: Paddlewheel Flowmeter

Outputs

Powered Mechanical Relays (0-8 model code dependent)
Pre-powered on circuit board switching line voltage
Four relays are fused together as one group, total current must not exceed 6.3A (resistive), 1/8 HP (93W)

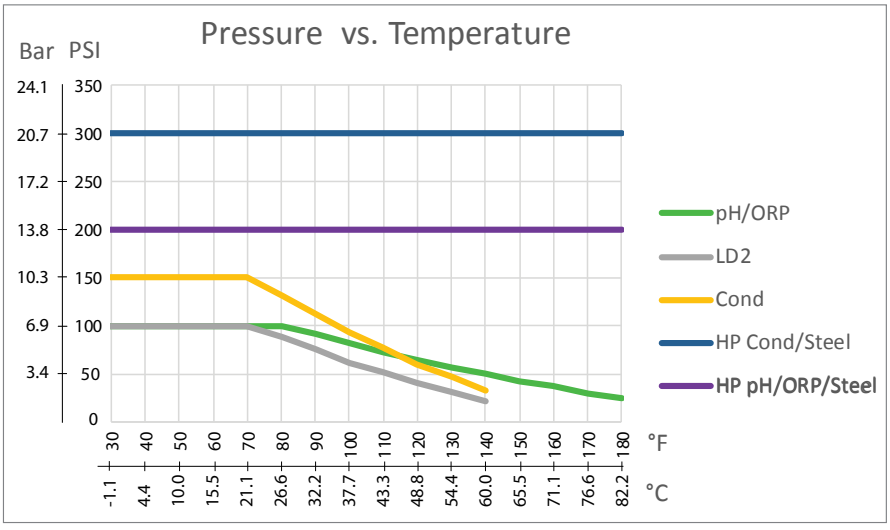
Dry Contact Mechanical Relays (0-8 model code dependent)
6 A (resistive), 1/8 HP (93W)
Dry contact relays are not fuse protected.

Pulse Outputs (0-8 model code dependent)
Opto-isolated, solid-state relay, 200mA, 40V DC
VLOWMAX = 0.05V @ 18mA

4 - 20 mA (0-16 model code dependent)
Internally powered, 15VDC, Fully isolated
1000 Ohm max resistive load
Resolution 0.0015% of span
Accuracy ± 0.5% of reading

Mechanical (Sensors) (*see graph)

Sensor	Pressure	Temperature	Materials	Process Connections
Electrodeless conductivity	0-150 psi (0-10 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 (0-7 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 (0-7bar)*	32-158°F (0-70°C)*		
Contacting conductivity (Condensate)	0-200 psi (0-14 bar)	32-248°F (0-120°C)	316SS, PEEK	3/4" NPTM
Contacting conductivity Graphite (Cooling Tower)	0-150 psi (0-10 bar)*	32-158°F (0-70°C)*	Graphite, Glass-filled PP, FKM o-ring	3/4" NPTM
Contacting conductivity SS (Cooling Tower)	0-150 psi (0-10 bar)*	32-158°F (0-70°C)*	316SS, Glass-filled PP, FKM o-ring	3/4" NPTM
Contacting conductivity (Boiler)	0-250 psi (0-17 bar)	32-401°F (0-205°C)	316SS, PEEK	3/4" NPTM
Contacting conductivity (High Pressure Tower)	0-300 psi (0-21 bar)*	32-158°F (0-70°C)*	316SS, PEEK	3/4" NPTM
pH (High Pressure)	0-300 psi (0-21 bar)*	32-275°F (0-135°C)*	Glass, Polymer, PTFE, 316SS, FKM	1/2" NPTM gland
ORP (High Pressure)	0-300 psi (0-21 bar)*	32-275°F (0-135°C)*	Platinum, Polymer, PTFE, 316SS, FKM	1/2" NPTM gland
Free Chlorine/Bromine	0-14.7 psi (0-1 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 (0-1 bar)	32-113°F (0-45°C)		
Total Chlorine	0-14.7 psi (0-1 bar)	32-113°F (0-45°C)		
Chlorine Dioxide	0-14.7 psi (0-1 bar)	32-131°F (0-55°C)		
Ozone	0-14.7 psi (0-1 bar)	32-131°F (0-55°C)		
Peracetic Acid	0-14.7 psi (0-1 bar)	32-131°F (0-55°C)		
Hydrogen Peroxide	0-14.7 psi (0-1 bar)	32-113°F (0-45°C)		
Flow switch manifold	0-150 psi (0-10 bar) up to 100°F (38°C)* 0-50 psi (0-3 bar) at 140°F (60°C)	32-140°F (0-60°C)*	GFRPP, PVC, FKM, Isoplast	3/4" NPTF
Flow switch manifold (High Pressure)	0-300 psi (0-21 bar)*	32-158°F (0-70°C)*	Carbon steel, Brass, 316SS, FKM	3/4" NPTF



Measurement Performance

	Range	Resolution	Accuracy
0.01 Cell Contacting Conductivity	0-300 µS/cm	0.01 µS/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 µS/cm	0.1 µS/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 µS/cm	1 µS/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 µS/cm	10 µS/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 µS/cm	1 µS/cm, 0.01 mS/cm, 0.1 mS/m, 0.001 S/m, 1 ppm	±1% of reading
	3,000-40,000 µS/cm	1 µS/cm, 0.01 mS/cm, 0.1 mS/m, 0.001 S/m, 1 ppm	±1% of reading
	10,000-150,000 µS/cm	10 µS/cm, 0.1 mS/cm, 1 mS/m, 0.01 S/m, 10 ppm	±1% of reading
	50,000-500,000 µS/cm	10 µS/cm, 0.1 mS/cm, 1 mS/m, 0.01 S/m, 10 ppm	±1% of reading
	200,000-2,000,000 µS/cm	100 µS/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

Temp.°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

Temp.°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.

Mechanical (Controller)

Enclosure Material Polycarbonate
Enclosure Rating NEMA 4X (IP65)
Dimensions 12.2W x 13.8H x 5.4D" (310 x 351 x 137 mm)
Display 320 x 240 pixel monochrome backlit display with touchscreen
Ambient Temperature -4 to 122°F (-20 to 50°C)
Storage Temperature -4 to 176°F (-20 to 80°C)
Humidity 10 to 90%, non-condensing

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 61326-1:2012
EN 61326-1:2013

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.

Model Code

W	CT	900P	AADE	W	M		S	ANNNN
Label	Base	Relays/Wiring	I/O Module#1-4	WiFi	Protocol	-	Sensor Mounting	Sensors #1-5

W	IN	900P	AADE	W	M		S	ANNNN
Label	Base	Relays/Wiring	I/O Module#1-4	WiFi	Protocol	-	Sensor Mounting	Sensors #1-5

W	BL	900P	AADE	W	M		ANNNNN
Label	Base	Relays/Wiring	I/O Module#1-4	WiFi	Protocol	-	Sensors #1-6

LABEL

W	Walchem

BASE

CT	Cooling Tower
BL	Boiler
IN	pH, Disinfection, Conductivity

RELAYS/WIRING

8 powered relays	
900H	Hardwired
900P	Prewired with USA power cord and 8 pigtails
900D	Prewired with DIN power cord, no pigtails
900B	Prewired with Brazilian power cord, no pigtails
7 powered 1 dry relays	
910H	Hardwired
910P	Prewired with USA power cord and 7 pigtails
910D	Prewired with DIN power cord, no pigtails
910B	Prewired with Brazilian power cord, no pigtails
2 opto 6 dry relays	
920H	Hardwired
920P	Prewired with USA power cord and two 20 ft. pulse cables
920D	Prewired with DIN power cord, no pigtails
920B	Prewired with Brazilian power cord, no pigtails
4 powered 4 dry relays	
930H	Hardwired
930P	Prewired with USA power cord and 4 pigtails
930D	Prewired with DIN power cord, no pigtails
930B	Prewired with Brazilian power cord, no pigtails
4 opto 4 dry relays	
940H	Hardwired
940P	Prewired with USA power cord and four 20 ft. pulse cables
940D	Prewired with DIN power cord, no pigtails
940B	Prewired with Brazilian power cord, no pigtails
4 opto 4 powered relays	
950H	Hardwired
950P	Prewired with USA power cord and four 20 ft. pulse cables
950D	Prewired with DIN power cord, no pigtails
950B	Prewired with Brazilian power cord, no pigtails
2 opto 6 powered relays	
960H	Hardwired
960P	Prewired with USA power cord, 6 pigtails, two 20 ft. pulse cables)
960D	Prewired with DIN power cord, no pigtails
960B	Prewired with Brazilian power cord, no pigtails
8 dry relays	
970H	Hardwired
970P	Prewired with USA power cord, no pigtails
970D	Prewired with DIN power cord, no pigtails
970B	Prewired with Brazilian power cord, no pigtails

I/O MODULES #1-4 (must be in alphabetical order)

N	No input output module
A	Dual Sensor Inputs
B	Dual Analog Inputs
C	Four Analog Inputs
D	Six Analog Inputs
E	Dual Analog Inputs + Four Analog Outputs
F	Dual Analog Outputs
G	Four Analog Outputs
H	Corrosion (Future)

WIFI (Future)

N	None
W	WiFi

COMMUNICATIONS PROTOCOL

N	None
M	Modbus TCP
B	BACnet IP (Future)
P	ProfiNet (Future)

SENSOR MOUNTING

N	None
S	Submersion
I	Inline
L	Loose flow switch manifold
P	Flow switch manifold on panel
F	Loose high pressure flow switch manifold
H	High Pressure flow switch manifold on panel*
S	Submersion
I	Inline
L	Loose flow switch manifold
P	Flow switch manifold on panel

SENSORS #1-5 (must be in alphabetical order)

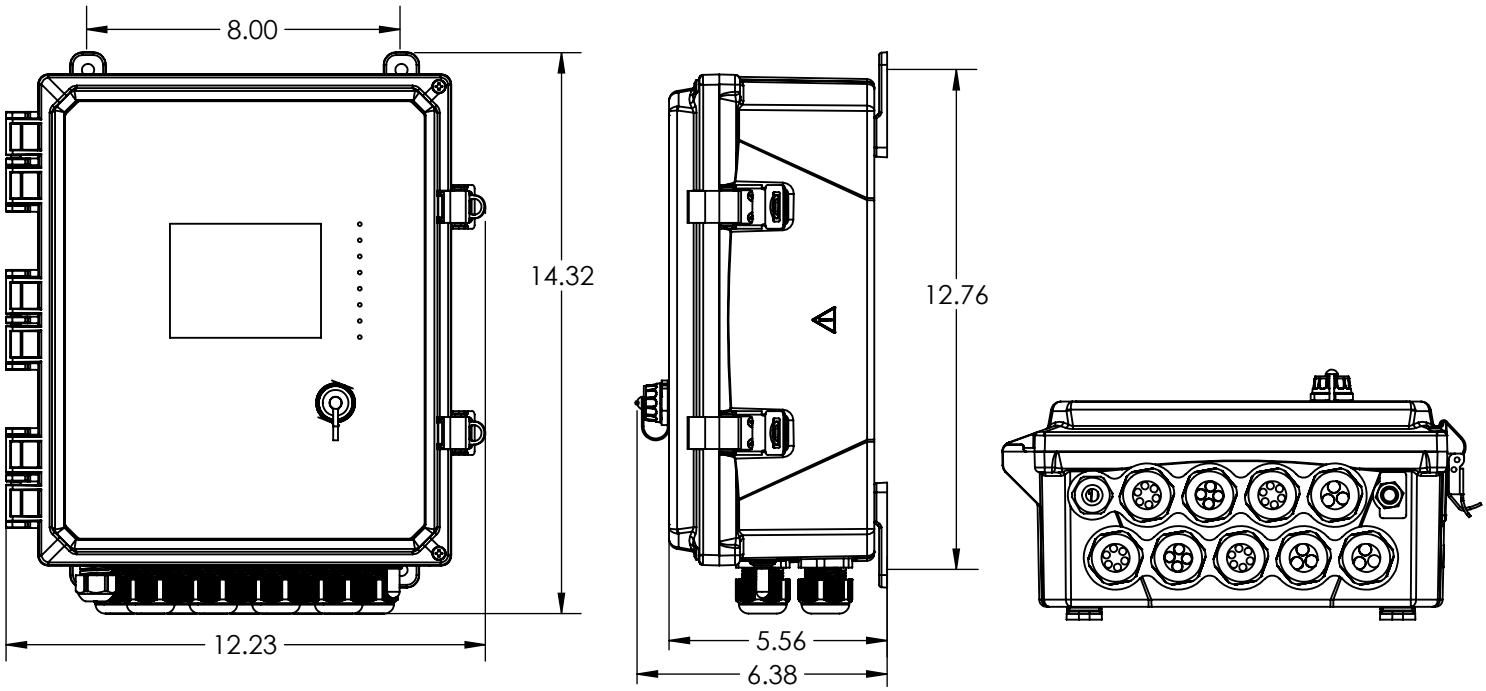
N	None
A	Graphite/PP cooling tower contacting conductivity
B	316SS/PP cooling tower contacting conductivity
C	Cooling tower, electrodeless conductivity
D	High pressure conductivity
E	Makeup conductivity
F	Flat pH
G	High pressure pH
H	Rod ORP
I	Flat ORP
J	High pressure ORP
K	Chlorine**
L	ClO_2**
M	Little Dipper**
O	Corrosion** (Future)

* If a high pressure manifold is selected, only Hi P sensors and Makeup available.
** Dipper, Corrosion, Chlorine, ClO2 sensors NOT available with Submersion mounting.

SENSORS #1-6 (must be in alphabetical order)

N	None
A	External Preamp
B	Flat WEL with ATC
C	Disinfection, no sensor
D	PEEK electrodeless
F	CCond, K=1.0, 100psi
G	CCond, K=0.1, 100psi
H	CCond, K=10, 100psi
I	CCond, K=0.01, 100psi
J	CCond, K=1.0, 200psi
K	CCond, K=0.1, 200psi
L	CCond, K=10, 200psi
M	CCond, K=0.01, 200psi
A	Boiler sensor with ATC, 250 psi, K=1.0, 20ft.cable
B	Boiler sensor no ATC, 250 psi, K=1.0, 20ft.cable
C	Condensate sensor with ATC, 200 psi, K=0.1, 10ft.cable
D	Boiler sensor with ATC, 250 psi, K=10, 20ft.cable

Dimensions



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