

Conductivity, pH/ORP & Disinfection



TOWN & COUNTRY PLASTICS

Customized For Precision

TC Model WAL-100M pH Controller



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 4-20mA or pulse solid state opto outputs)
 - In-range or Out-of-range activation
 - Probe Wash Timer
 - 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
 - PID Control (when purchased with 4-20mA or pulse solid state opto outputs)

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

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	± 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 $\mu\text{S/cm}$	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.
0-500Hz, 1.00 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 61326-1:2012

EN 61326-1:2013

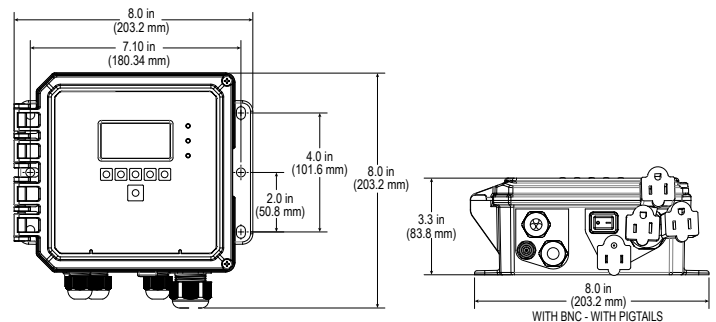
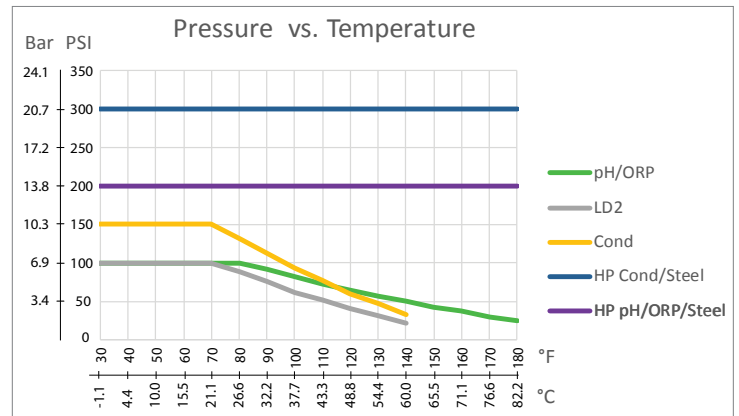
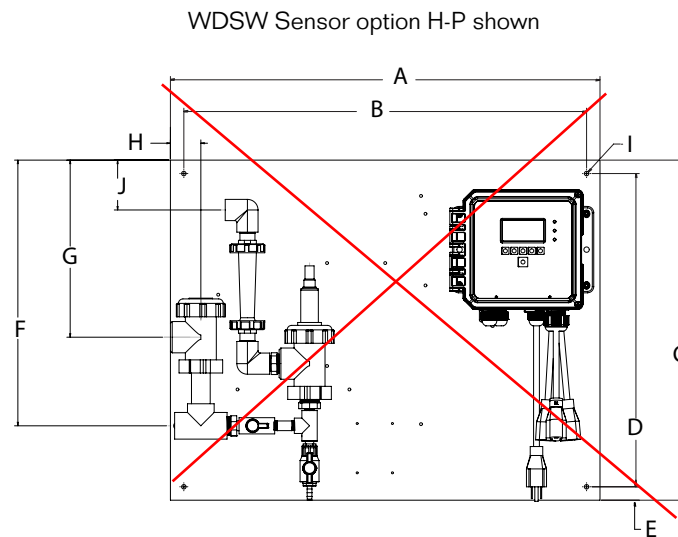
Note: For EN61000-4-6, EN61000-4-3 the controller met performance criteria B. This equipment is suitable for use in establishments other than domestic and those directly connected to a low voltage (100-240 VAC) power supply network which supplies buildings used for domestic purposes.

Specifications

Mechanical (Sensors) (*see graph)

Sensor	Pressure	Temperature	Materials	Process Connections
Electrodeless conductivity	0-150 psi (0-10 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 (0-7 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 (0-7 bar)*	32-158°F (0-70°C)*		
Contacting conductivity	0-200 psi (0-14 bar)	32-248°F (0-120°C)	316SS, PEEK	3/4" NPTM
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

Dimensions



Panel Mounted Flow Switch Manifold Dimensions

	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
WPHPW sensor options F, J or K	22.5" 571 mm	21.5" 546 mm	11.75" 298 mm	10.75" 273 mm	0.75" 19 mm	4" 102 mm	1.5" 38 mm	11" 279 mm	0.25" 6.35 mm	
WCNW sensor option E	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	
WDSW sensor options H - P	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

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

Analog Output

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

Sensors (WDSW)

N = No sensor
 A = Free chlorine, 0-20 ppm, 20 ft cable
 B = ClO₂, 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 = ClO₂ 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 Cl₂ 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

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