W100W Series

The W100W series provide an economical and reliable way to keep your cooling tower, boiler, or condensate 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
- Multiple language support allows simple setup no matter where your business takes you
- The third control relay allows the controller to be used in more places than other entry level products
- Economical package with no additional cost for timer functionality
- Complete flexibility in the function of each relay
  - Bleed on conductivity
  - Bleed time proportional to makeup water volume
  - Boiler Blowdown on conductivity using intermittent sampling
  - Feed in proportion to bleed time
  - Feed time proportional to makeup water volume
  - Feed as a percentage of elapsed time
  - Probe wash
  - Biocide timer with pre-bleed and post-feed bleed lockout options
  - Alarm
- Optional analog (4-20 mA) output for recording, datalogging or connection to building energy management systems

WCTW WBLW

Relays/Wiring

100H = 3 powered relays, hardwired
100P = 3 powered relays, prewired USA power cord & pigtail
100D = 3 powered relays, prewired DIN power cord, no pigtail
110H = 3 dry relays, hardwired
110P = 3 dry relays, prewired USA power cord, no pigtail
110D = 3 dry relays, prewired DIN power cord, no pigtail

Analog Output

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

Sensors (WCTW)

N = No sensor
A = Inline/submersion graphite contacting conductivity
B = Graphite contacting conductivity + Flow Switch manifold on panel
C = High pressure contacting conductivity
D = High pressure contacting cond + Flow Switch manifold on panel
E = Inline/submersion 316SSS contacting conductivity
F = 316SSS contacting conductivity + Flow Switch manifold on panel
G = Inline/submersion electrodeless conductivity
H = Electrodeless conductivity + Flow Switch manifold on panel

Sensors (WBLW)

N = No sensor
A = Boiler sensor with ATC, 250 psi, 20 ft cable
B = Boiler sensor without ATC, 250 psi, 20 ft cable
C = Condensate sensor with ATC (cell constant 0.1), 200 psi, 10 ft cable
D = Boiler sensor with ATC, up to 100 mS/cm (cell constant 10), 250 psi, 20 ft cable

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
**Measurement Performance**

<table>
<thead>
<tr>
<th>Range Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1 Cell Contacting Conductivity</td>
<td>0.300 μS/cm</td>
</tr>
<tr>
<td>1.0 Cell Contacting Conductivity</td>
<td>0.050 μS/cm</td>
</tr>
<tr>
<td>10.0 Cell Contacting Conductivity</td>
<td>0.005 μS/cm</td>
</tr>
</tbody>
</table>

**Electrodeless Conductivity**

<table>
<thead>
<tr>
<th>Range Resolution</th>
<th>Accuracy</th>
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</thead>
<tbody>
<tr>
<td>500-12,000 μS/cm</td>
<td>± 0.5% of reading</td>
</tr>
<tr>
<td>10,000-150,000 μS/cm</td>
<td>± 0.1% of reading</td>
</tr>
<tr>
<td>3,000-40,000 μS/cm</td>
<td>± 0.01% of reading</td>
</tr>
<tr>
<td>100-500,000 μS/cm</td>
<td>± 0.001% of reading</td>
</tr>
</tbody>
</table>

**Temperature**

- 23 to 50°F (−5 to 26°C) ± 1% of reading within range
- 0.1°F (0.1°C)

**Electrodeless Conductivity**

- 500-12,000 μS/cm
- 10,000-150,000 μS/cm
- 3,000-40,000 μS/cm
- 100-500,000 μS/cm

**Typical response time:**

- <2 seconds

**Inputs**

- Power: 100-240 VAC, 50 or 60 Hz, 7A max
- Fuse: 6.3 Amp

**Digital Input Signals**

- 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, red switch)

**Types**

- Interlock

**Low Speed Counter-Type**

- Optically-isolated input
- Provides isolated 9V power
- Current consumption when input is closed: 2.3 mA nominal
- 0.1Hz, 50 micro second pulse width

**Devices supported**

- Any device with isolated open drain, open collector, transistor or red switch

**Types**

- Contacting Flowmeter

**High-Speed Counter-Type**

- Optically-isolated input
- Provides isolated 9V power
- Current consumption when input is closed: 2.3 mA nominal
- 0.500Hz, 1.000 micro second pulse width

**Devices supported**

- Any device with isolated open drain, open collector, transistor or red 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), 1/3 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 or 3 model code dependent)**

- 6 A (resistive), 1/3 HP (93W) per relay
- Dry contact relays are not fuse protected

<table>
<thead>
<tr>
<th>Pressure</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-50 psi</td>
<td>0-20°C (−7 to 68°F)</td>
</tr>
<tr>
<td>0-150 psi</td>
<td>0-100°F (−7 to 38°C)</td>
</tr>
</tbody>
</table>

**Agency Certifications**

- 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

**Mechanical (Sensors)**

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Pressure</th>
<th>Temperature</th>
<th>Materials</th>
<th>Process Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cond</td>
<td>0.150 psi up to 100°F (38°C)*</td>
<td>32-140°F (−60 to +60°C)</td>
<td>GFRPP, Graphite, FKM</td>
<td>3/4” NPTF</td>
</tr>
<tr>
<td>Cond</td>
<td>0.150 psi up to 100°F (38°C)*</td>
<td>32-140°F (−60 to +60°C)</td>
<td>GFRPP, 316SS, 316L</td>
<td>3/4” NPTF</td>
</tr>
<tr>
<td>Cond</td>
<td>0.150 psi up to 100°F (38°C)*</td>
<td>32-140°F (−60 to +60°C)</td>
<td>PP, PVC, PFA</td>
<td>3/4” NPTF</td>
</tr>
<tr>
<td>Cond</td>
<td>0.150 psi up to 100°F (38°C)*</td>
<td>32-140°F (−60 to +60°C)</td>
<td>GFRPP, PVC, FKM, Isoplast</td>
<td>3/4” NPTF</td>
</tr>
<tr>
<td>Cond</td>
<td>0.300 psi (20 bar)*</td>
<td>32-140°F (−60 to +60°C)</td>
<td>Carbon steel, steel, brass</td>
<td>3/4” NPTF</td>
</tr>
<tr>
<td>Cond</td>
<td>0.300 psi (10 bar)*</td>
<td>32-40°F (−20 to +4°C)</td>
<td>316SS, 316L, PEK</td>
<td>3/4” NPTF</td>
</tr>
<tr>
<td>Cond</td>
<td>0.250 psi (17 bar)*</td>
<td>32-40°F (−20 to +4°C)</td>
<td>316SS, PEK</td>
<td>3/4” NPTF</td>
</tr>
</tbody>
</table>

**Dimensions**

<table>
<thead>
<tr>
<th>Panel Mounted Flow Switch Manifold Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
</tr>
<tr>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>WCTW</td>
</tr>
</tbody>
</table>

**Sensor option H**

- Sensor option H
- 24° 610 mm
- 22.5° 571 mm
- 19° 483 mm
- 17.5° 446 mm
- 16° 409 mm
- 14.5° 368 mm
- 13° 356 mm
- 11° 343 mm
- 9° 331 mm
- 7° 319 mm
- 5° 307 mm
- 3° 295 mm
- 1° 283 mm

**Sensor options B, F**

- Sensor options B, F
- 13° 330 mm
- 12° 305 mm
- 11° 281 mm
- 10° 256 mm
- 9° 232 mm
- 8° 208 mm
- 7° 184 mm
- 6° 160 mm
- 5° 136 mm
- 4° 112 mm
- 3° 88 mm

**Sensor options D**

- Sensor options D
- 22.5° 571 mm
- 21.5° 546 mm
- 20° 521 mm
- 19° 496 mm
- 18° 471 mm
- 17° 446 mm
- 16° 421 mm
- 15° 396 mm
- 14° 371 mm
- 13° 346 mm
- 12° 321 mm
- 11° 296 mm
- 10° 271 mm
- 9° 246 mm
- 8° 221 mm
- 7° 196 mm
- 6° 171 mm
- 5° 146 mm
- 4° 121 mm
- 3° 96 mm
- 2° 71 mm
- 1° 46 mm
### Measurement Performance

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1 Cell Contacting Conductivity</td>
<td>0.3,000 µS/cm</td>
<td>±1% of reading</td>
</tr>
<tr>
<td>1.0 Cell Contacting Conductivity</td>
<td>0.3,000 µS/cm</td>
<td>±1% of reading</td>
</tr>
<tr>
<td>10.0 Cell Contacting Conductivity</td>
<td>0.3,000 µS/cm</td>
<td>±1% of reading</td>
</tr>
<tr>
<td>Electrodeless Conductivity</td>
<td>0.3,000 µS/cm</td>
<td>±1% of reading</td>
</tr>
<tr>
<td>100-240 V Power Inputs</td>
<td>0.1 °C</td>
<td>±1% of reading</td>
</tr>
</tbody>
</table>

- **Temperature**: 23 to 500°F (-5 to 260°C) 0.1°F (0.1°C) ± 1% of reading within range
- **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
- **10.0 Cell Contacting Conductivity**: 0-300,000 µS/cm 10 µS/cm, 0.01 mS/cm, 0.1 mS/m, 0.001 S/m, 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

- **Typical response time**: <2 seconds

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

### Outputs

- **Powered Mechanical Relays (0 or 3 model code dependent)**
  - Post-powered on circuit board switching line voltage.
  - 6 A (resistive), 1/8 HP (93W) per relay
  - 0-150 psi up to 100°F (38°C)*

- **Dry contact mechanical relays (0 or 3 model code dependent)**
  - 6 A (resistive), 1/8 HP (93W) per relay
  - 0-150 psi up to 100°F (38°C)*

- **Mechanical Controller**

  - **Enclosure**: Poly carbonate
  - **Enclosure Rating**: NEMA 4X (IP65)
  - **Display**: 128 x 48 graphic backlight display
  - **Ambient Temperature**: -4 to 131°F (-20 to 55°C)
  - **Shipping Temperature**: -4 to 176°F (-20 to 80°C)
  - **Shipping weight**: 6 A (resistive), 1/8 HP (93W) per relay

### Dimensions

**Panel Mounted Flow Switch Manifold Dimensions**

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WCTW Sensor option H shown</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pressure vs. Temperature</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Agency Certifications

- **Safety**: UL 61101-1:2012, 3rd Edition
- **EMC**: IEC 61326-1:2011

**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.

### Mechanical (Sensors) (*See graph*)

**Sensor**

<table>
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<tr>
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<td>0-150 psi up to 100°F (38°C)*</td>
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<td>GFRPP, Graphite, FKM</td>
<td>3/4&quot; NPTF</td>
</tr>
<tr>
<td>316 SS contacting conductivity tower</td>
<td>32-140°F (0-60°C)*</td>
<td>GFRPP, 316SS, FKM</td>
<td>3/4&quot; NPTF</td>
</tr>
<tr>
<td>High pressure tower</td>
<td>32-150°F (70-60°C)*</td>
<td>316SS, PE/EP</td>
<td>3/4&quot; NPTF</td>
</tr>
<tr>
<td>Low pressure manifold</td>
<td>32-100°F (0-38°C)*</td>
<td>GFRPP, PVC, FKM</td>
<td>3/4&quot; NPTF</td>
</tr>
<tr>
<td>High pressure manifold</td>
<td>32-150°F (70-60°C)*</td>
<td>Carbon steel, steel, brass</td>
<td>3/4&quot; NPTF</td>
</tr>
</tbody>
</table>

**Electrodeless tower**

<table>
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**Contacting Flowmeter**

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**High pressure tower**

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**High pressure manifold**

<table>
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**Cond**

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**pH/ORP/Steel**

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**pH/ORP/Graphite**

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**Boiler/condensate**

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### Specifications

**High-Speed Counter-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)

**Low Speed Counter-Type**

- **Electrical**: Optically-isolated input.
  - Provides isolated 9V power.
  - Current consumption when input is closed: 0.12mA nominal.
  - 0.12mA, 50 msc minimum pulse width

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

**Inputs**

- **Power**: 100-240 VAC, 50 or 60 Hz, 7A max
- **Fuse**: 6.3 Amp

**Digital Input Signals (2)**

- **State-Type**: Interlock
- **Low Speed Counter-Type**: Interlock
- **High-Speed Counter-Type**: Interlock

**Camera**

- **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 device with isolated open drain, open collector, transistor or reed switch

**Types**: Contacting Flowmeter, Paddlewheel Flowmeter

**Agency Certifications**

- **Safety**: UL 61101-1:2012, 3rd Edition
- **EMC**: IEC 61326-1:2011

**Note**: Conductivity ranges above apply at 25°C. At higher temperatures, the range is reduced per the range multiplier chart.
Cooling Tower/Boiler Controllers

W100W Series

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Summary of Key Benefits

- Large display with icon based programming makes setup easy
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D = Boiler sensor with ATC, up to 100 mS/cm (cell constant 10), 250 psi, 20 ft cable

Ordering Information