Dulcometer® WS Series Controllers

ProMinent Dulcotest sensors measure the process and the controller displays the value on a large LCD screen; control outputs can operate various control devices (e.g. metering pumps) to keep the process within control limits using proportional control; alarm relays are available for fault annunciation and an optional analog output is available for recording the measured value. A control 4-20 mA output is available as an option on the F2K2 model, but alarm relays cannot be used.

Features

- The transmitter is provided with a high-quality differential input circuit with the sample liquid potential as a reference
- 3-1/2 digit LCD readout for displaying measured and set values
- Calibration and setpoint adjustment by potentiometer
- All controls are accessible from the front side
- Power supply 115 V, 60 Hz

Mounting

- **Wall mount:** plastic housing
  - Dimensions: 6.89"H x 5.67"W x 4.92"D (175 mm x 144 mm x 125 mm)
  - Weight: approx. 3.16 lbs. (1.43 kg)
  - Terminal accessibility: front
  - Protection class: NEMA 4X (IP 65)

- **Panel mount:** housing of chemical-resistant and shock-resistant PPE
  - Dimensions: 4.72"H x 5.67"W x 3.35"D (120 mm x 144 mm x 85 mm)
  - Weight: approx. 3.16 lbs. (1.43 kg)
  - Terminal accessibility: rear
  - Protection class: NEMA 4X (IP 65)

Control Capabilities

- Modified proportional control (minimum of 10 minutes retention time)
- Setpoint control

Outputs

- Pulse train outputs for metering pump(s)
- Relay outputs
- Optional analog 0/4-20 mA output for control or measured value

Measured Variables

- pH
- Redox Potential
- Chlorine (free and total)
- Ozone
## Dulcometer® WS Series Controllers

### pH

**Description**

<table>
<thead>
<tr>
<th>Measured Variable: pH</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Measured range: 0 - 14 pH</td>
</tr>
<tr>
<td>• Control Range: 0 - 14 pH</td>
</tr>
<tr>
<td>• Sensor Input: ProMinent sensors PHE, PHEX, PHEP and PHED by means of an SN6 type connector</td>
</tr>
</tbody>
</table>

**Versions:**

- **PHWS 014 F2K2**
  - Provided with two proportionally acting pulse train outputs for pacing two solenoid-driven metering pumps (acid and base), with two change-over relay outputs. Contact load 250 V, 3 A. NOTE: Pulse train outputs and relay outputs have common set values. Factory Set Pulse Rate: 100 pulses/minute.
  - This system is typically applied to the controlled feeding of acid and caustic in two-way pH control systems.
  - Automatic temperature compensation is included. This requires connection to a Pt 100 platinum resistance thermometer via terminal.
  - Time monitor: A built-in relay will trip an alarm when measured variable fails to return to an acceptable range within the predetermined (adjustable) time.

- **PHWS 014 F1K1**
  - Provided with one pulse train output for pacing a solenoid-driven metering pump (direction of control switch-selectable to acid or base), and one change-over relay output for one set value. Factory Set Pulse Rate: 100 pulses/minute.
  - Note: Automatic temperature compensation and time monitor not included.

**Options for all PHWS models:**

- Power Cord, 6 ft. (2 m) 115 VAC
  - 741203.4
- Power Cord, 6 ft. (2 m) 230 VAC
  - 7724015.8
- Option S 01: Power supply 220/240 VAC, 50/60 Hz, 24/42 VAC, 50/60 Hz. Please specify with order
  - 914711.7
- Option WS 02: Standard signal output of measured value: 0/4-20 mA = pH 0 - 14. 0/4 mA switch-selectable on the optional plug-in circuit board; electrically isolated output burden 750 Ohm maximum. Can be factory changed to a control current output for control of up to two devices that use a control 4-20 mA input (F2K2 only).
  - Specify either control current or measured value output on order.
  - 914932.9
ProMinent

Measured Variable: Redox Potential

- Measured range: 0-1000 mV
- Control Range: 0-1000 mV
- Sensor Input: ProMinent sensors RHE, RHEX by means of an SN6 type connector

Versions:

RHWS 1000 F2K2
Provided with two proportionally acting pulse train outputs for pacing two solenoid-driven metering pumps (oxidant and reducing agent), with two change-over relay outputs. Contact load 250 V, 3 A. NOTE: Pulse train outputs and relay outputs have common set values. Factory Set Pulse Rate: 100 pulses/minute.

The system is provided with a time monitor: A built-in relay will trip an alarm when measured variable fails to return to an acceptable range within the predetermined time (adjustable from 1 minute to 6 hours).

This system is typically applied to the controlled feeding of oxidants and reducing agents.

RHWS 1000 F1K1
Provided with one pulse train output for pacing a solenoid-driven metering pump (direction of control switch-selectable), and one change-over relay output for one set value. Factory Set Pulse Rate: 100 pulses/minute.

Note: Automatic temperature compensation and time monitor not included.

Options for all RHWS models:

- Power Cord, 6 ft. (2 m) 115 VAC 741203.4
- Power Cord, 6 ft. (2 m) 230 VAC 7724015.8
- Option S 01: Power supply 220/240 VAC, 50/60 Hz, 24/42 VAC, 50/60 Hz. Please specify with order 914711.7
- Option WS 02: Standard signal output of measured value: 0/4-20 mA = 0-1000 mV. 0/4 mA switch-selectable on the optional plug-in circuit board; electrically isolated output burden 750 Ohm maximum. Can be factory changed to a control current output for control of up to two devices that use a control 4-20 mA input (F2K2 only).

Specify either control current or measured value output on order.
## Dulcometer® WS Series Controllers
### Chlorine

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Measured Variable:</strong> Chlorine</td>
<td></td>
</tr>
<tr>
<td>• Measured range: standard 0-5 ppm</td>
<td></td>
</tr>
<tr>
<td>• Control Range: standard 0-2 ppm</td>
<td></td>
</tr>
<tr>
<td>• Sensor Input: ProMinent sensors CLE-4P (free chlorine) or CGE2-4P (total chlorine) by means of a 4-pole connector</td>
<td></td>
</tr>
</tbody>
</table>

### Versions:
- **CLWS 02 F1K1**
  - Provided with one pulse train output for pacing a solenoid-driven metering pump, and one change-over relay output for one set value. Contact load = 250 V, 3A. Factory Set Pulse Rate: 100 pulses/hour.
  - Part No.: 925027.5

- **CLWS 02 F1K2**
  - Provided with a proportional acting pulse train output for pacing a solenoid-driven metering pump, and two change-over relay outputs. The pulse train output and one of the relay outputs have a common set value. Contact load = 250 V, 3A. Factory Set Pulse Rate: 100 pulses/hour.
  - Time monitor: A built-in relay will trip an alarm when measured variable fails to return to an acceptable range within the predetermined (adjustable) time.
  - Part No.: 925021.8

### Options for CLWS:
- • Power Cord, 6 ft. (2 m) 115 VAC | 741203.4
- • Power Cord, 6 ft. (2 m) 230 VAC | 7724015.8
- • Option S 01: Power supply 220/240 VAC, 50/60 Hz, 24/42 VAC, 50/60 Hz. Please specify with order | 914711.7
- • Option WS 020: Measurement and control range of analyzer 0-20 ppm (CLE) or 0-10 ppm (CGE). NOTE: Measuring range of sensor determines actual upper measuring limit. | 914929.5
- • Option WS 02: Standard signal output of measured value: 0/4-20 mA = 0-2 ppm of chlorine. 0/4 mA switch-selectable on the optional plug-in circuit board; electrically isolated output burden 750 Ohm maximum. In combination with option WS 020 0/4-20 mA = 0-10 ppm (CLE or CGE). | 914932.9
- • Option WS 02-2: In combination with option WS 020 0/4-20 mA = 0-20 ppm (CLE) or 0-10 ppm (CGE). Can be factory changed to a control current output for control of up to two devices that use a control 4-20 mA input. Specify either control current or measured value output on order. | 924925.1
## Dulcometer® WS Series Controllers

### Ozone, Combination

**Description**

<table>
<thead>
<tr>
<th>Measured Variable: Ozone</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Measured range: 0-3 ppm</td>
</tr>
<tr>
<td>• Control Range: 0-2 ppm</td>
</tr>
<tr>
<td>• Sensor Input: ProMinent sensor OZE by means of a 4-pole connector</td>
</tr>
</tbody>
</table>

**Versions:**

**OZWS 05 K2**

Provided with two alarm values, which can be set accurate to the digit, and two change-over relay outputs. Contact load = 250 V, 3A.

**Part No.: 925030.9**

**Options for OZWS:**

- **Power Cord, 6 ft. (2 m) 115 VAC**
  - 741203.4

- **Power Cord, 6 ft. (2 m) 230 VAC**
  - 7724015.8

- **Option S 01:** Power supply 220/240 VAC, 50/60 Hz, 24/42 VAC, 50/60 Hz. Please specify with order
  - 914711.7

- **Option WS 02:** Standard signal output of measured value: 0/4-20 mA = 0-1 O₃. 0/4 mA switch-selectable on the optional plug-in circuit board; electrically isolated output burden 750 Ohm maximum.
  - 914932.9

- **Option WS 02-2:** In combination with option WS 02, but 0/4-20 mA = 0-2 ppm O₃.
  - 924925.1

### Combination pH and Redox Potential

**PRW**

Combined pH and redox monitor/controller. NEMA 3 plastic housing.

**Part No.: 924955.8**

**Typical Application:** Swimming Pool

**Options for PRW:**

- **Power Cord, 6 ft. (2 m) 115 VAC**
  - 741203.4

- **Power Cord, 6 ft. (2 m) 230 VAC**
  - 7724015.8

- **Option S 01:** Power supply 220/240 VAC, 50/60 Hz, 24/42 VAC, 50/60 Hz. Please specify with order
  - 914711.7

- **Option WS 02:** Standard signal output of measured value: 0/4-20 mA = 0-1 O₃. 0/4 mA switch-selectable on the optional plug-in circuit board; electrically isolated output burden 750 Ohm maximum.
  - 914932.9