

EWCO

ELECTROLYZED WATER CO.

OPERATION MANUAL

EWCO 240 System



EWCO
+1 754-800-4020
service@ewco.com

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Specifications

Model	EWCO 240
Power	AC 110/220V 50/60HZ 180W
Dimensions	32 x 17 x 42 cm (12.5 x 6.5 x 16.5 in)
Weight	11.8 kg (26 lbs.)
Production Cell Type	Single cell electrolysis for generating hypochlorous acid (HOCl)
Concentration Range	20 to 150 ppm of free available chlorine (FAC)
Ampere Settings	13 to 22 amp
Pump Speed Settings	0 to 19 (max. speed to min. speed)

Requirements



Ambient Temperature	5 to 50 °C (41 to 122 °F)
Feed Water & Brine Temperature	10 to 30 °C (50 to 86 °F)
Feed Water & Brine Water Quality	Hardness < 80 ppm (higher will damage the electrolysis cells)
Humidity	Less than 96% Relative Humidity (RH)
Minimum Flow Rate	3 L/min
Maximum Water Pressure	40 PSI

Buttons and Display




No	Description
1	LED display
2	System is running
3	Check error code in LED display
4	System RUN On/Off
5	Mode button (see uses below)
6	Set button (see uses below)
7	Reset alarm to resume running

Operational Modes

<p>Standard Mode</p> 	<p>The standard mode is the default and should be used unless connecting system to a holding tank with a float sensor.</p> <p>Setting to standard mode:</p> <ol style="list-style-type: none"> 1. Press and hold "Set" button for 3 seconds and release 2. Press "Reset" button once 3. Press and hold "Mode" button for 3 seconds and release
<p>Level Mode</p> 	<p>This mode must be used when connecting the system to a holding tank using a float sensor. The system will automatically stop running when the water level rises to the level to activate the float sensor.</p> <p>Setting to level mode:</p> <ol style="list-style-type: none"> 1. Press and hold "Set" button for 3 seconds and release 2. Press "Set" button once 3. Press and hold "Mode" button for 3 seconds and release

Settings & Performance

<p>Flow Rate measured in Liters per minute (L)</p> 	<p>The flow rate can be controlled by tightening or loosening the inflow water valve. A higher flow rate will decrease the concentration of free available chlorine (FAC) and a lower flow rate will increase the concentration of FAC.</p> <p>Displaying the flow rate:</p> <ol style="list-style-type: none"> 1. Press and hold “Set” button for 3 seconds and release. LED display will begin to blink. 2. Press “Mode” button until liters per minute (L) setting is displayed.
<p>Voltage (v)</p>	<p>The voltage is a performance measurement and is not adjustable.</p> <p>Displaying the voltage:</p> <ol style="list-style-type: none"> 1. Press and hold “Set” button for 3 seconds and release. LED display will begin to blink. 2. Press “Mode” button until voltage (v) setting is displayed.
<p>Ampere (A) Max. ampere: 22 Min. ampere: 13</p>	<p>The ampere is an adjustable setting. The range is from 13 to 22 ampere. Higher settings will increase the concentration of free available chlorine (FAC).</p> <p>Adjusting the ampere:</p> <ol style="list-style-type: none"> 1. Press and hold “Set” button for 3 seconds and release. LED display will begin to blink. 2. Press “Mode” button until ampere (A) setting is displayed. 3. Press “Set” button to increase the ampere. Press “Reset” button to decrease the ampere. 4. Press and hold “Mode” button for 3 seconds and release to complete.
<p>Pump Speed (PS) Max. speed: 0 Min. speed: 19</p>	<p>The pump speed is an adjustable setting. The range is from 0 to 19. Lower settings will increase the pump speed and thus increase the additive dosed into the electrolysis cell. For most purposes, the pump speed should be kept in mid-range.</p> <p>Adjusting the pump speed:</p> <ol style="list-style-type: none"> 1. Press and hold “Set” button for 3 seconds and release. LED display will begin to blink. 2. Press “Mode” button until pump speed (PS) setting is displayed. 3. Press “Set” button to increase the pump speed. Press “Reset” button to decrease the pump speed. 4. Press and hold “Mode” button for 3 seconds and release to complete.

System Alarms

Error Code	Reason	Action
Err1	Low Flow	Check the flow of the feed water into the equipment. Once corrective action has been taken to sustain the water flow above 3 L/min, press the “Reset” button to cancel the alarm. If unresolved, contact the service center.
Err2	Low Current	Disconnect additive tank and refill with a new brine. Re-attach the tank once completely dissolved. Press the “Reset” button to cancel the alarm. If unresolved, contact the service center.
Err3	High Current	Disconnect additive tank and refill with a new brine. Re-attach the tank once completely dissolved. Press the “Reset” button to cancel the alarm. If unresolved, contact the service center.
Err4	Low Voltage	The voltage is abnormally low. Please contact the service center for further assistance.
Err5	Fan Error	The cooling fan is not functioning. Please contact the service center for further assistance.

Safety Precautions	Brine / Additive Formulas
<p>Ventilation Risks</p>	<p>Electrolyzed water contains small quantities of hydrogen gas (H₂), chlorine dioxide gas (ClO₂), and ozone gas (O₃) that is released from solution into the air. These gases, if accumulated, can be explosive. Electrolyzed water contains free chlorine molecules. Free chlorine molecules have the potential to form chlorine gas (Cl₂) when the pH of the solution becomes acidic. Chlorine gas, if inhaled, can cause respiratory irritation or injury and is a health risk. Equipment must be installed in a ventilated area to avoid the accumulation of gases. Do not install equipment near heat sources over 400°C (750°F)</p>
<p>Electric Shock and Fire Risks</p>	<p>Only use certified outlets. Do not place the equipment in water or allow the equipment to be exposed to external sources of water. Do not operate equipment if electric cord is damaged. Do not operate equipment in environments of relative humidity greater than 95%. In the event of an electric shock or fire, equipment must be removed from the power source immediately.</p>

Formula #	HOCl Solution	Formula Instructions
<p>1</p>	<p>Using Formula #1 the system will generate a free chlorine solution in which over 25% of the chlorine molecules will be hypochlorous acid (HOCl).</p> <p>pH below 8 **GOOD** >25% of FAC is HOCl</p> <p>When using reverse osmosis (RO) water that has a pH less than 6 as the system inflow water, the pH of the HOCl solution will be improved.</p> <p>pH below 7 **BETTER** >70% of FAC is HOCl</p>	<p>Formulation</p> <ul style="list-style-type: none"> • 28% Food Grade Salt (NaCl). • 72% Water (tap water, reverse osmosis or distilled) <p>When preparing 2-Liter additive tank:</p> <ol style="list-style-type: none"> 1. Add 550 g (≈2 cups) of salt* 2. Fill remainder with water (1400 mL) 3. Shake until salt fully dissolved <p>* No iodine or other additives (ie. kosher salt)</p>
<p>2</p>	<p>Using Formula #2 the system will generate a free chlorine solution in which over 70% of the chlorine molecules will be hypochlorous acid (HOCl).</p> <p>pH below 7 **BETTER** >70% of FAC is HOCl</p>	<p>Formulation</p> <ul style="list-style-type: none"> • 28% Food Grade Salt (NaCl). • 72% Food Grade 5% White Distilled Vinegar <p>When preparing 2-Liter additive tank:</p> <ol style="list-style-type: none"> 1. Add 550 g (≈2 cups) of salt* 2. Fill remainder with 5% distilled vinegar (1400 mL) 3. Shake until salt fully dissolved <p>* No iodine or other additives (ie. kosher salt)</p>
<p>3</p>	<p>Using Formula #3 the system will generate a free chlorine solution in which over 90% of the chlorine molecules will be hypochlorous acid (HOCl).</p> <p>pH below 6 **BEST** 90-99% of FAC is HOCl</p>	<p>ATTENTION: Proper personal protective gear required when preparing additive with hydrochloric acid (HCl).</p> <p>Formulation</p> <ul style="list-style-type: none"> • 21.5% food grade salt (NaCl). • 75% Water (tap water, reverse osmosis or distilled) • 3.5% hydrochloric acid (HCl 32%). <p>When preparing 2-Liter additive tank:</p> <ol style="list-style-type: none"> 1. Add 430 g (≈2 cups) of salt* 2. Add 1500 mL of water 3. Shake until salt fully dissolved 4. Add 70 mL of hydrochloric acid (HCl 32%)** <p>* No iodine or other additives (ie. kosher salt) **For food contact, must use FCC grade HCl.</p>



Changing Additive

Replenish additive tank when low. If additive runs out, the system will stop and display Error 2.

Changing Additive Using Formula #1

- Power Off system
- Remove suction line and cap from additive tank
- Add 2 cups of salt to additive tank
- Fill remainder of additive tank with tap water
- Replace cap and shake until dissolved
- Replace suction line
- Power On system and press “Reset” button

Controlling Concentration

The following settings are recommendations for reaching approximate concentrations of free available chlorine (FAC) in solution measured in parts per million (ppm). The 3 variables below can be adjusted to change the concentration.

1. Flow Rate (L/min) – controlled by blue valve allowing feed water to flow into system
2. Ampere (A) - controlled by system settings
3. Pump Speed (PS) - controlled by system settings

Using Additive Formula 1 (Water and Food Grade Salt)

Flow Rate 1.0 - 1.5 L/min

Lowering the flow rate will increase the ppm.
Raising the flow rate will decrease the ppm.

Pump Speed (PS) **17.5 A** **22.0 A**

10 PS	111 ppm	131 ppm
8 PS	116 ppm	136 ppm
6 PS	120 ppm	142 ppm
4 PS	125 ppm	147 ppm
2 PS	131 ppm	153 ppm
0 PS	136 ppm	160 ppm

Using Additive Formula 1 (Water and Food Grade Salt)

Flow Rate 2.0 - 3.0 L/min

Lowering the flow rate will increase the ppm.
Raising the flow rate will decrease the ppm.

Pump Speed (PS) **17.5 A** **22.0 A**

10 PS	83 ppm	98 ppm
8 PS	87 ppm	102 ppm
6 PS	90 ppm	106 ppm
4 PS	94 ppm	111 ppm
2 PS	98 ppm	115 ppm
0 PS	102 ppm	120 ppm

Using Additive Formula 1 (Water and Food Grade Salt)

Flow Rate 3.5 - 5.0 L/min

Lowering the flow rate will increase the ppm.
Raising the flow rate will decrease the ppm.

Pump Speed (PS) **17.5 A** **22.0 A**

10 PS	42 ppm	49 ppm
8 PS	43 ppm	51 ppm
6 PS	45 ppm	53 ppm
4 PS	47 ppm	55 ppm
2 PS	49 ppm	58 ppm
0 PS	51 ppm	60 ppm

Using Additive Formula 2 (Distilled White Vinegar and Food Grade Salt)

Flow Rate 1.0 - 1.5 L/min

Lowering the flow rate will increase the ppm.
Raising the flow rate will decrease the ppm.

Pump Speed (PS) **17.5 A** **22.0 A**

Raise pH ↑ pH Lower pH ↓	10 PS	97 ppm	114 ppm
	8 PS	101 ppm	119 ppm
	6 PS	105 ppm	123 ppm
	4 PS	110 ppm	129 ppm
	2 PS	114 ppm	134 ppm
	0 PS	119 ppm	140 ppm

Using Additive Formula 2 (Distilled White Vinegar and Food Grade Salt)

Flow Rate 2.0 - 3.0 L/min

Lowering the flow rate will increase the ppm.
Raising the flow rate will decrease the ppm.

Pump Speed (PS) **17.5 A** **22.0 A**

Raise pH ↑ pH Lower pH ↓	10 PS	73 ppm	86 ppm
	8 PS	77 ppm	90 ppm
	6 PS	80 ppm	93 ppm
	4 PS	83 ppm	97 ppm
	2 PS	86 ppm	101 ppm
	0 PS	90 ppm	106 ppm

Using Additive Formula 2 (Distilled White Vinegar and Food Grade Salt)

Flow Rate 3.5 - 5.0 L/min

Lowering the flow rate will increase the ppm.
Raising the flow rate will decrease the ppm.

Pump Speed (PS) **17.5 A** **22.0 A**

Raise pH ↑ pH Lower pH ↓	10 PS	37 ppm	43 ppm
	8 PS	38 ppm	45 ppm
	6 PS	40 ppm	47 ppm
	4 PS	42 ppm	49 ppm
	2 PS	43 ppm	51 ppm
	0 PS	45 ppm	53 ppm

Using Additive Formula 3 (Water, Food Grade Salt, and HCl)

Flow Rate 1.0 - 1.5 L/min

Lowering the flow rate will increase the ppm.
Raising the flow rate will decrease the ppm.

		Pump Speed (PS) 17.5 A	22.0 A
Raise pH ↑	10 PS	139 ppm	163 ppm
	8 PS	144 ppm	169 ppm
	6 PS	150 ppm	176 ppm
Lower pH ↓	4 PS	157 ppm	184 ppm
	2 PS	163 ppm	192 ppm
	0 PS	170 ppm	200 ppm

Using Additive Formula 3 (Water, Food Grade Salt, and HCl)

Flow Rate 2.0 - 3.0 L/min

Lowering the flow rate will increase the ppm.
Raising the flow rate will decrease the ppm.

		Pump Speed (PS) 17.5 A	22.0 A
Raise pH ↑	10 PS	104 ppm	122 ppm
	8 PS	108 ppm	127 ppm
	6 PS	113 ppm	133 ppm
Lower pH ↓	4 PS	118 ppm	138 ppm
	2 PS	122 ppm	144 ppm
	0 PS	128 ppm	150 ppm

Using Additive Formula 3 (Water, Food Grade Salt, and HCl)

Flow Rate 3.5 - 5.0 L/min

Lowering the flow rate will increase the ppm.
Raising the flow rate will decrease the ppm.

		Pump Speed (PS) 17.5 A	22.0 A
Raise pH ↑	10 PS	52 ppm	61 ppm
	8 PS	54 ppm	64 ppm
	6 PS	56 ppm	66 ppm
Lower pH ↓	4 PS	59 ppm	69 ppm
	2 PS	61 ppm	72 ppm
	0 PS	64 ppm	75 ppm

Measuring Concentration

The concentration of free available chlorine (FAC) can be measured with standard chlorine test paper. The range and sensitivity measurable are 10, 50, 100, and 200 ppm.

For greater accuracy or to measure high range free available chlorine levels, the chlorine concentration can be measured with a high range chlorine photometer.

Supplies for measuring free chlorine concentration can be found at: store.ewco.com and search SKU listed below.

Chlorine Test Paper (SKU: P-1050)

Chlorine Photometer (SKU: P-1047)

Maintenance

Over time and depending on use, mineral scale can build-up on the electrolysis cells. Mineral scale build-up depends on the quality of the inflow water. If the hardness of the inflow water is less than 80 ppm, scale will build up very slowly and the system may not require maintenance for many years. Using the incorrect salt can cause mineral scale to build up very quickly. If mineral scale does build up, the electrical current required to generate a free chlorine solution of hypochlorous acid will be disrupted.

When to do Maintenance:

When the actual ampere of the system drops to a level below 90% of the set ampere, the systems electrolysis cells should be descaled of mineral deposits.

How to do Maintenance:

Simply run the system using additive formula #3 with hydrochloric acid (HCl). The HCl will descale the mineral deposits from the electrolysis cells. Run the system until the actual ampere returns to the set ampere. This could take 30 minutes or several hours depending on the amount of scale.