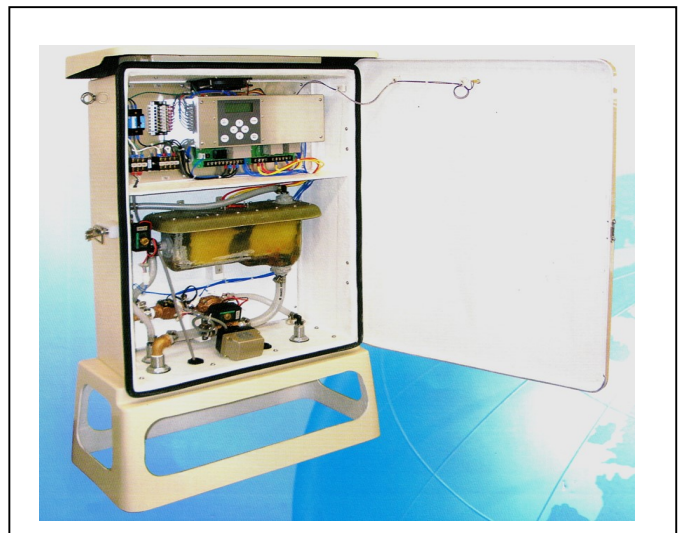


# Palm Beach Springs Water Company Inc.

## ElectroLife

FOR SCALE REMOVAL AND ENERGY SAVINGS

### USER'S MANUAL MODEL EL-10A



### Innovative Design and Technology

ADVANCED SOLUTIONS THROUGH APPLIED ELECTROCHEMISTRY

## **A note from the manufacturer, *innovative*DesignsandTechnology**

We sincerely appreciate your purchase of the Model EL-10A. We hope that you will enjoy the many industrial benefits that will be attained from the efficient operation of your cooling tower system.

The User's Manual is provided as a guidance in the proper installation and operation of the ElectroLife device.

Please ensure that this manual is read in its entirety to ensure the safe and proper operation of this device. For easy reference, please keep this manual close at hand.

### **For your safety, please be sure to follow the instructions below.**

- In order to prevent incidents such as a fire, electrocution and injuries, read through this section before starting operation and follow the instructions for proper use.
- Safety cautions are divided into two categories, "**Warning**" and "**Caution**". "Warning" indicates a situation where any possibility of incidents exists that may cause death and/or serious injuries to the operator, whereas "Caution" indicates a possibility of incidents that may cause only minor injuries to the operator and/or damage to the property.

However, items labeled with "Caution" may lead to serious consequences depending on the situation. Since both "Warning" and "Caution" include important messages for the user, please be sure to comply with them.



Warning



Caution



Caution



Ventilation



Prohibited



Prohibited

### **1. Be careful not to be electrocuted.**

- Be sure to connect the grounding cable.
- Do not touch the inside of the device with wet hands. It may cause electrocution.
- Do not open the side panel unless it is absolutely necessary.



Warning



Prohibited

## **2. Operating the device properly.**

- Do not use the device for any purpose other than specified.



Caution

## **3. Proper handling of the electrical power cord.**

- Do not handle the power cord improperly.
- Keep the cord away from heat, oil or sharp edges.



Prohibited

## **4. Contact your purchase source for servicing or repairs.**

- Ask for repairs at the store you purchased the product from or Innovative Design & Technology. Inexperienced repairs may cause improper performance, accidents or injuries.

## **5. ElectroLife requires maintenance.**

Failure to properly maintain the device may cause inferior water quality, damages to the device, or a fatal malfunction. For maintenance service, contact your sales agent or Innovative Design & Technology.

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## Chapter 1. General specifications

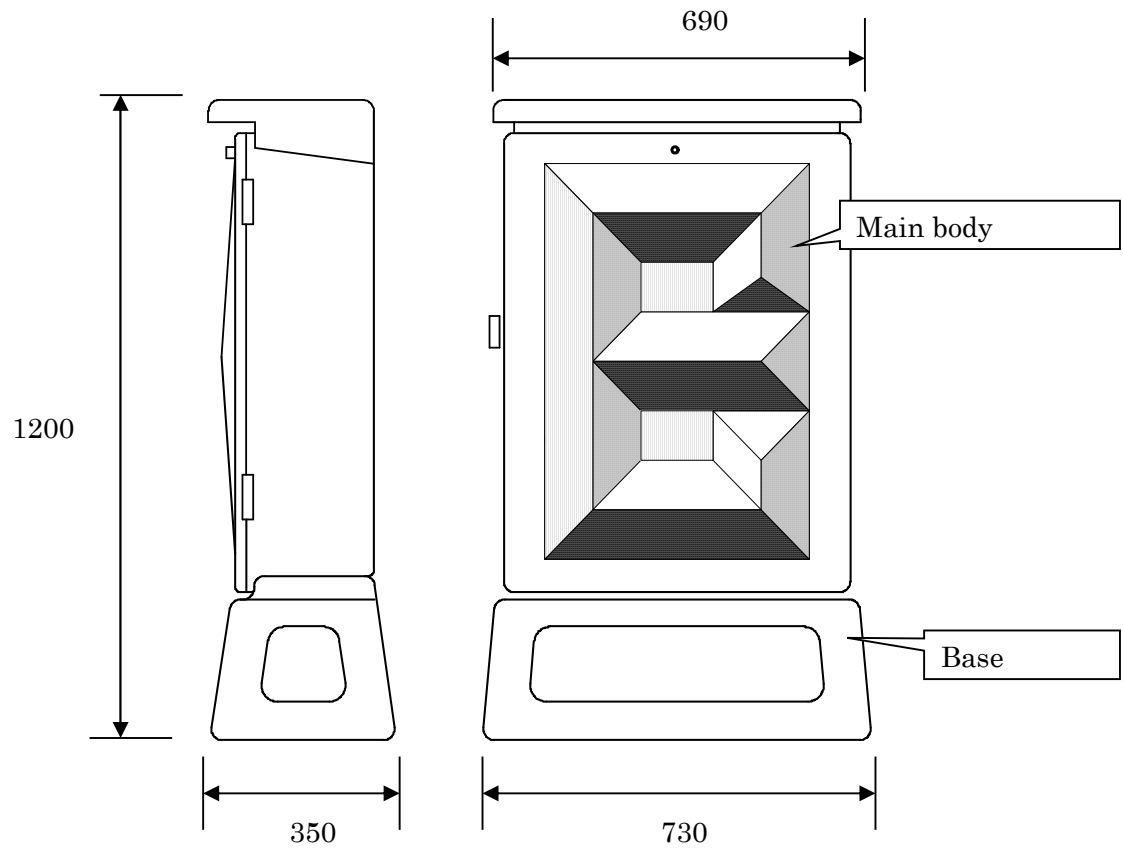
### 1-1 Specification

Dimensions	Power unit and water channel (main body): 350 <sup>D</sup> x 700 <sup>W</sup> x 900 <sup>H</sup> Supporting frame: 350 <sup>D</sup> x 700 <sup>W</sup> x 300 <sup>H</sup>
Weight	Main body: 36kg (79.2 lbs) Supporting frame: 4kg (8.8 lbs)
Minimum required water pressure	0.04 Mpa (0.4kgf /cm <sup>2</sup> ) or more
Rated voltage	Single phase: AC 100V-240V, 50/60 Hz
Pressure resistance of electrolytic tank	0.2Mpa (2.0kgf/cm <sup>2</sup> ) or less
Input voltage	AC 100V-240V
Max. power consumption	800W
Processing method	Maximum electrolytic current @ 10A(constant current method)
Maximum water flow	25 liters/min.
Electrolytic tank	No-diaphragm – consecutive type system
Life of electrodes (*1)	1.5 year.
Conductivity meter	Automatic calculation from electrolytic current and voltage and water temperature (*margin of error 20% or less).
Blowing method(*2)	Selectable from 3 methods.
Cleaning and softening method	Fully automatic polarity switching and simultaneous drainage method.
Electric power system	Electric current control system

(\*1) Changes by the water quality and the operating time.

(\*2) Any external blowing unit is optional and not included.

## 1-2 Size of unit



Overall height: 1200mm (48.0")

Overall width: 690mm (27.6")

Base width: 730mm (29.2")

Base depth: 350mm (14.0")

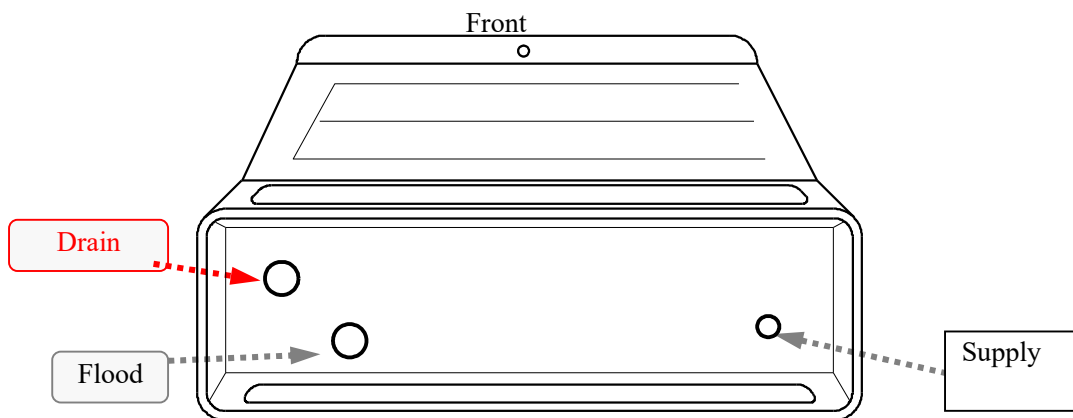
## Chapter 2. Installation and set up

### 2-1 Installation location requirements

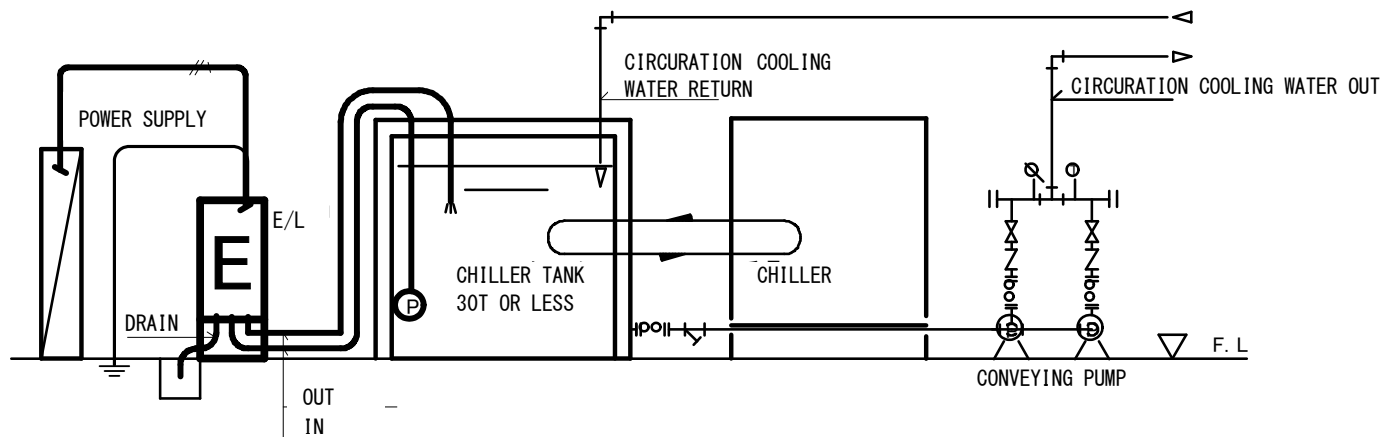
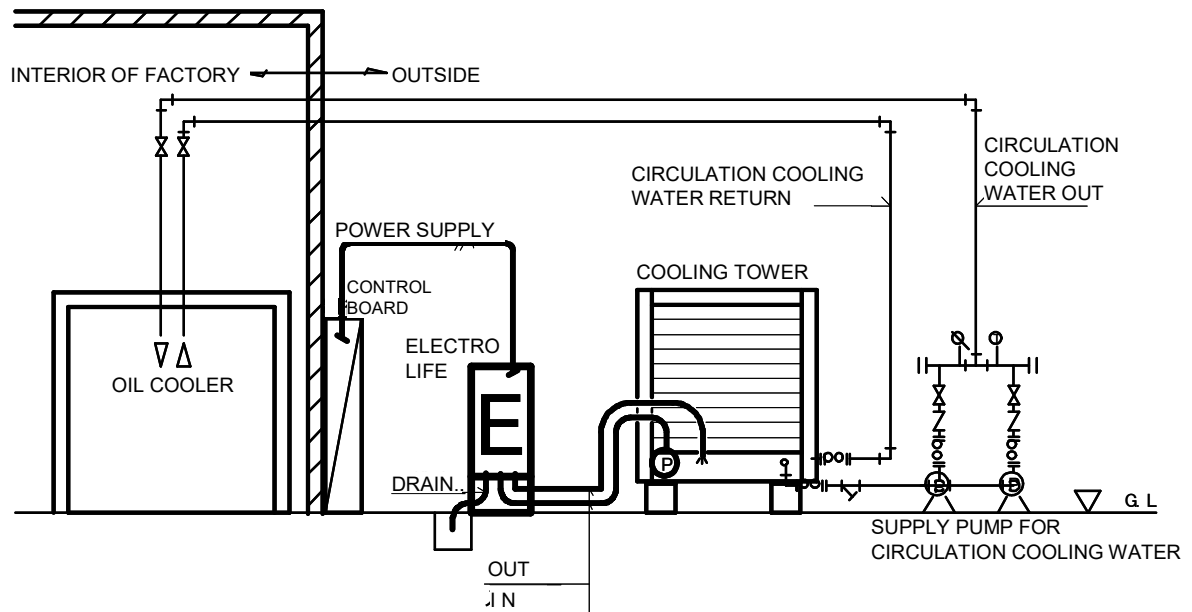
1. Single-phase AC power supply at 100-240V.
2. A space for disposing mixture of solid and water in sludge form.
3. Select a location where the ambient temperature remains between 4°C/39°F and 40°C/104°F.
4. Avoid installing in a location subject to high temperature and high humidity.
5. As much as possible, keep this device away from direct sunlight.
6. Avoid installing the device in direct pathways of wind and rain.
7. Use a pump with the capacity of 5A or less for circulating the water supply.
8. The surface for the installation should be either concrete or steel.
9. If this device must be installed at a high height, ensure that safe conditions are present and that a proper installation is done to accommodate these conditions.
10. As much as possible install the device near the cooling system.
11. Avoid a location with too much vibration or noise.
12. Leave adequate space for opening the front door.
13. Provide adequate space for maintenance work.
14. Leave spacing of at least 1,000mm (40.0") in front and 500mm (20.0") on both sides of the device.

### 2-2 Installation

1. To secure the device to the flooring, please secure the unit by using a foundation bolt.
2. Ensure that the electrical power is not supplied to the unit.
3. Please connect the water supply hose, the flood and drain hoses as shown in the figure below.



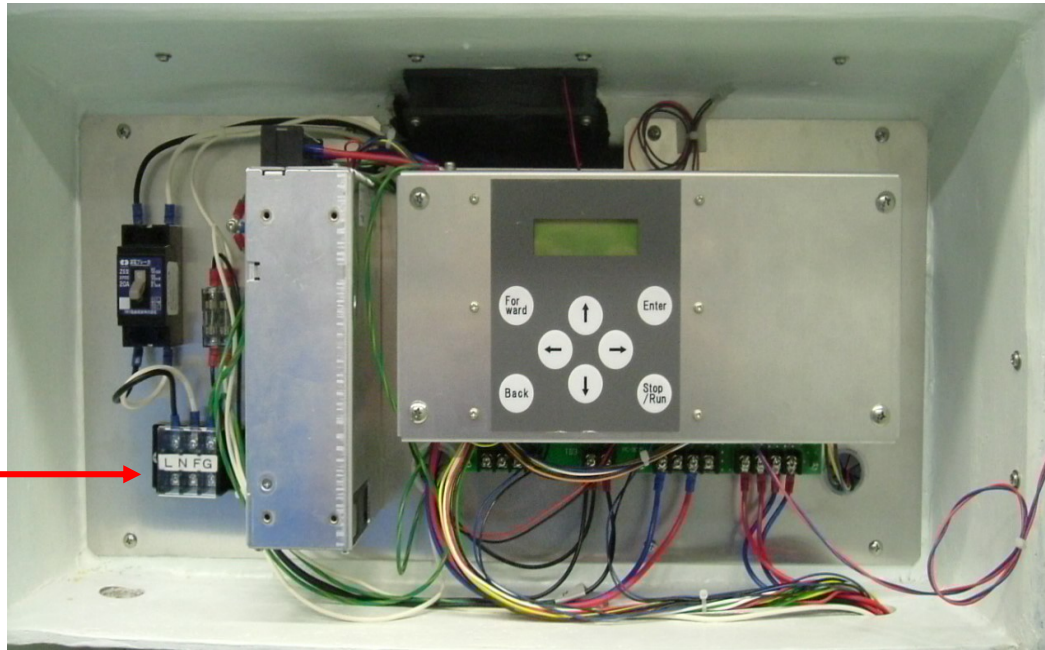
## Sample Installations:





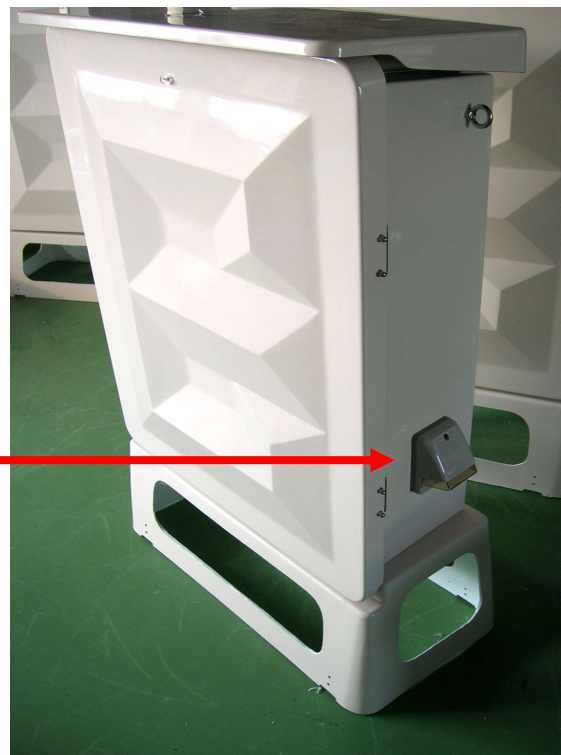
#### 4. Wiring connections:

L N F G

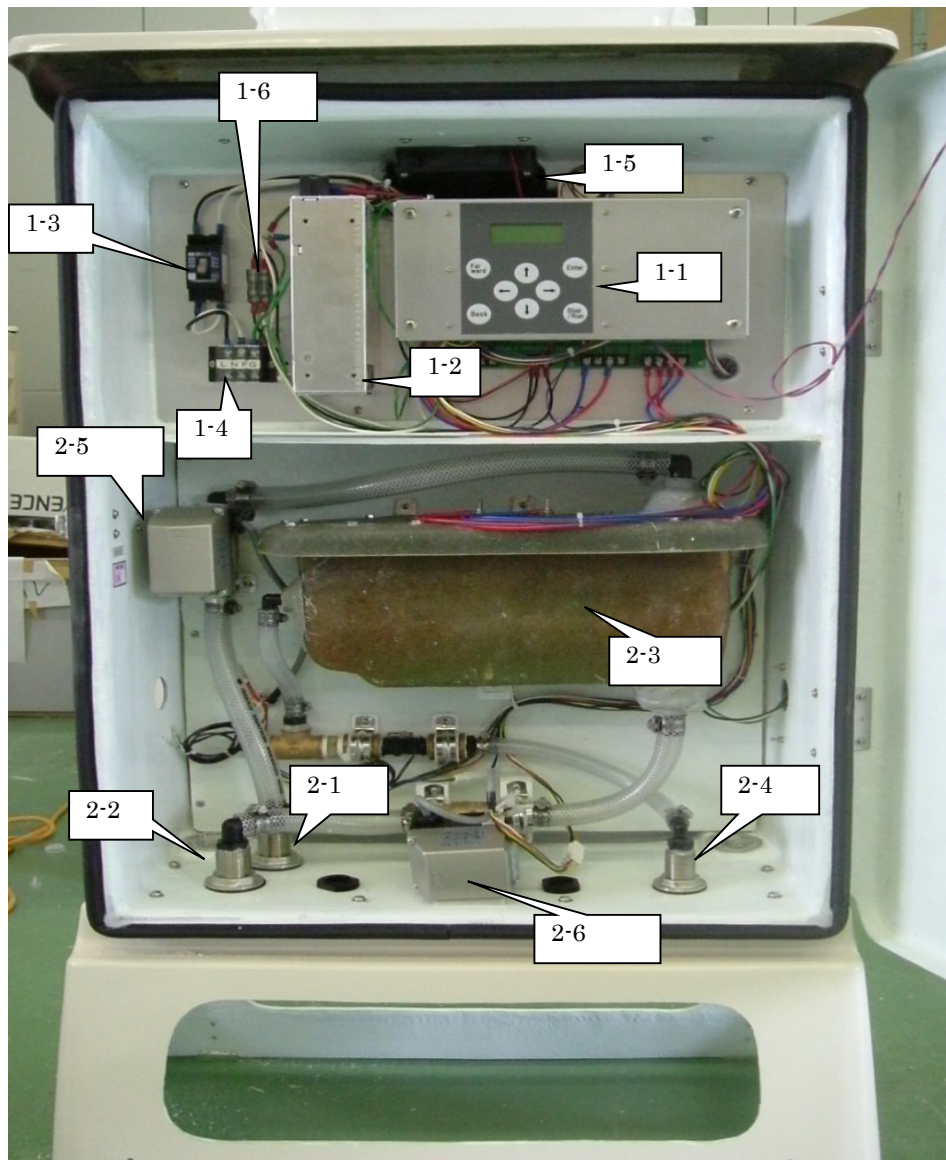


**L:** AC 100~240v connection  
**N:** AC 100~240v connection  
**F G:** Ground line connection

Power supply outlet for water pump

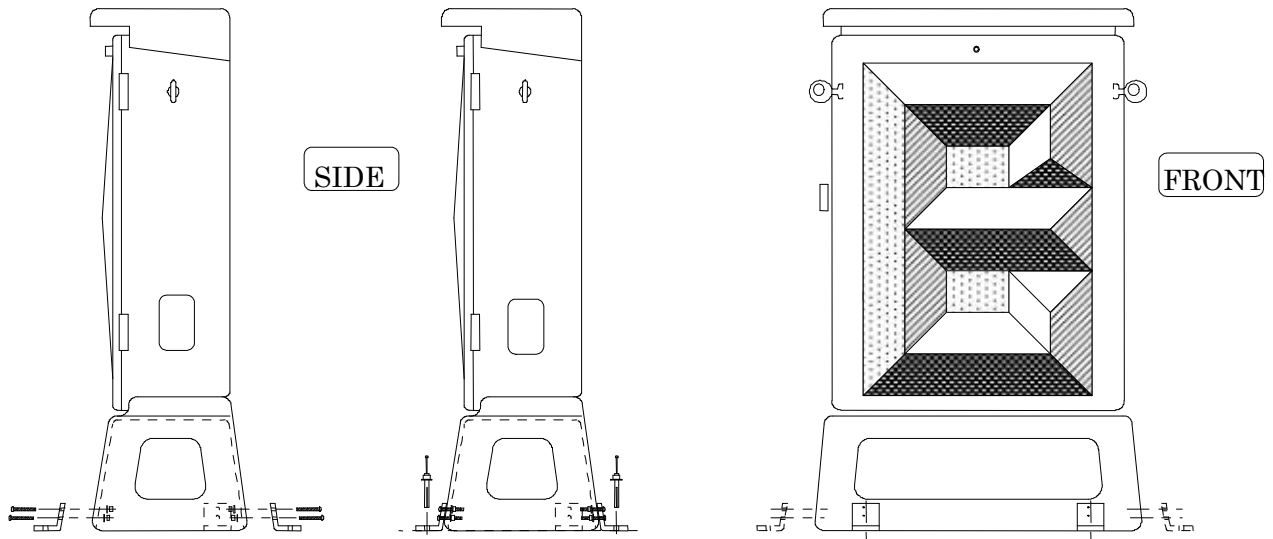


## 2-3: Explanation of components



Component	Description
1-1:	Operation Panel
1-2:	Direct Current Power Supply
1-3:	Breaker Switch
1-4:	AC Power Supply Terminal
1-5:	Cooling Fan
1-6:	Fuse for Water Pump
2-1:	Flood Entry
2-2:	Drain Entry
2-3:	Chamber
2-4:	Feed Water Entry
2-5:	Flood Valve
2-6:	Drain Valve

## 5. Installation of the device onto a solid surface.



## 6. Confirmation of flow rate.

Please verify that the flow rate is approximately 10 LPM (2.6 GPM). Do not exceed 30 LPM of flow. The device will automatically stop when the flow rate is 1 LPM or lesser.

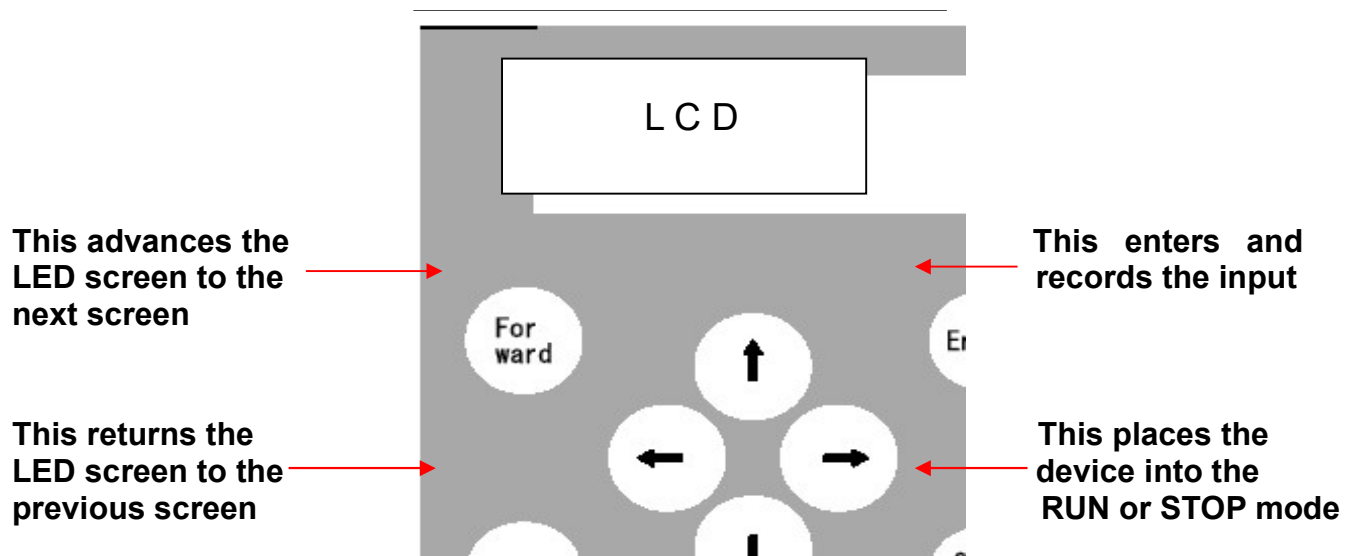
## Chapter 3. Operation switches and displays

### 3-1 Operation mode

This device has three operation modes.

Type of Mode	Purpose
Operation Mode	Mode in which the device is operational. When the breaker switch is turned on, the device will automatically shift into this Operation Mode.
Setting Mode	Mode allowing for operational conditions to be set. The breaker switch is turned on while pushing “Enter” switch.
Maintenance mode	Mode when an internal waterway of the device is washed by the acid solution etc. The breaker switch is turned on while pushing “Forward” switch.

### 3-2 Operation panel



## LED SCREENS APPEARING IN THE OPERATION MODE:

No.	LCD display	Description of display	Note
1	<b>R1•EC</b> <b>00000 µs/cm</b>	EC Electric Conductivity of Water	A calculative electric conduction rate is displayed. This is not a measuring device.
2	<b>R2•Amp</b> <b>00.0 A</b>	Electrolytic current	
3	<b>R3•E. Volt</b> <b>00.0 V</b>	Electrolytic voltage	
4	<b>R4•Tempe</b> <b>000 °C</b>	Water temperature	
5	<b>R5•Rem. T</b> <b>00 M</b>	Polarity change interval displayed in minutes.	The remaining time until the polarity reverses is displayed.
6	<b>R5•Rem. T</b> <b>00 S</b>	Polarity change interval displayed in seconds.	The remaining time until the polarity reverses is displayed.
7	<b>R6•W. Flow</b> <b>ON or OFF</b>	Flow rate ON or OFF	When water flow is more than 1 LPM minute, “on” is displayed. When water flow is less than 1 LPM, “OFF” is displayed.
8	<b>R7•AMPxTRT</b> <b>000 kAh</b>		The integrated value of machine time and electrolytic current.
9	<b>R8•SetAmp</b> <b>00 A</b>	Set rate of electric current	
10	<b>R9•Pol.C.T</b> <b>00 Hour</b>	Set duration between reversal of polarity.	
11	<b>R10•W.T.1</b> <b>000 sec</b>	Wash time1	
12	<b>R11•W.T.2</b> <b>000 sec</b>	Wash time 2	
13	<b>R12•W.T.3</b> <b>000 min</b>	Wash time 3	
14	<b>R13•EC ADJ</b> <b>0000 %</b>	Adjustment to level of electric conductivity	
15	<b>R14•Dra Str</b> <b>00000 µs/cm</b>	Drain start by electric conductivity	
16	<b>R15•Dra End.</b> <b>00000 µs/cm</b>	Drain stop by electric conductivity	
17	<b>R16•AMPxTRT</b> <b>000 kAh</b>	Count of electrode exhaustion	

18	<b>R17-SetDra</b> <b>INT. or EXT.</b>	Option drainage	
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## LED SCREENS APPEARING IN THE SETTING MODE:

No.	LCD display	Description of display	Note
1	<b>P1 SetAmp</b> <b>OO A</b>	Electrolytic current	The current value decreases when ↓ switch is pushed The current value increases when ↑ switch is pushed. When Enter switch is pushed, completes the input. The maximum value is 10A , Minimum value is 1A
2	<b>P2 Pol.C.T</b> <b>OOO Hour</b>	Polarity change interval displayed in minutes.	The current value decreases when ↓ switch is pushed The current value increases when ↑ switch is pushed. When Enter switch is pushed, completes the input. The maximum value is 60 hours. , Minimum value is 1hour.
3	<b>P3 W.T.1</b> <b>OOO sec</b>	Wash time1	The current value decreases when ↓ switch is pushed The current value increases when ↑ switch is pushed. When Enter switch is pushed, completes the input. The maximum value is 300 seconds. Minimum value is 300 seconds.
4	<b>P4 W.T.2</b> <b>OOO sec</b>	Wash time 2	The current value decreases when ↓ switch is pushed The current value increases when ↑ switch is pushed. When Enter switch is pushed, completes the input. The maximum value is 300 seconds , Minimum value is 0 second.
5	<b>P5 W.T.3</b> <b>OOO min</b>	Wash time 3	The current value decreases when ↓ switch is pushed The current value increases when ↑ switch is pushed. When Enter switch is pushed, completes the input. The maximum value is 120 minutes. , Minimum value is 0 minute.
6	<b>P6 EC ADJ</b> <b>OOO %</b>	Adjustment to level of Electrical Conductivity	The current value decreases when ↓ switch is pushed The current value increases when ↑ switch is pushed. When Enter switch is pushed, completes the input. The maximum value is 999%. Minimum value is 10%.



7	<b>P7 Dra Str</b> <b>000 µs/cm</b>	Drain start by electric conductivity	Please consult the selling company.
8	<b>P8 Dra End.</b> <b>000 µs/cm</b>	Drain stop by electric conductivity	Please consult the selling company.
9	<b>P9 AMPxTRT</b> <b>000 kAh</b>	Count of electrode exhaustion	Please consult the selling company.
10	<b>P10 SelDra</b> <b>INT. or EXT.</b>	Option drainage	Please consult the selling company.

## LED SCREENS SHOWING THE STANDARD SET VALUES:

No.	LCD	Description of Display	Factory Set Values
1	<b>P1 SetAmp</b> <b>000 A</b>	Electrolytic current	8 A
2	<b>P2 Pol.C.T</b> <b>000 Hour</b>	Polarity change interval displayed in Hours.	4 hours
3	<b>P3 W.T.1</b> <b>000 sec</b>	Wash time1	30 sec.
4	<b>P4 W.T.2</b> <b>000 sec</b>	Wash time1	20 sec.
5	<b>P5 W.T.3</b> <b>000 min</b>	Wash time1	1 min.
6	<b>P6 EC ADJ</b> <b>000 %</b>	Adjustment to level of electrical conductivity.	100 %
7	<b>P7 Dra Str</b> <b>000 µs/cm</b>	Drain start by electric conductivity	9990
8	<b>P8 Dra End.</b> <b>000 µs/cm</b>	Drain stop by electric conductivity	9980
9	<b>P9 AMPxTRT.</b> <b>000 kAh</b>	Count of electrode exhaustion	110
10	<b>P10 SelDra</b> <b>INT. or EXT.</b>	EXT. = Option drainage	INT

## LED SCREENS SHOWN IN THE MAINTENANCE MODE:

The displays in the MAINTENANCE MODE are the same as the displays shown in the OPERATION MODE. A period of 1 minute is fixed for the polarity change. WT1 and WT2 indicates an operational status that is same as what occurs under the setting number. Under this display WT3 is not in effect.

## **Chapter 4. Optional functions**

### **4-1 Additional drainage (P10 SelDra INT. or EXT.)**

This is an additional system of drainage.

A pump and an electric ball valve are needed to the exterior of ElectroLife. When ElectroLife controls and an electric conduction rate reaches setting upper limit, the attached pump starts drainage of circulating water. When it reaches below a low-limit-setting value, ElectroLife controls and it stops drainage of circulating water. At this time, EL is performing the usual electrolysis operation.

A lot of drainage than the drainage inside EL is performed, and it aims at management of an electric conduction rate.

In order to change to this drainage method, the wiring from a control board is also needed.

### **4-2 Numerical display of life of electrodes (P9 AMPxTRT. 000 kAh)**

Exhaustion of the electrode is calculated and displayed. The standard exhausting of electrode is one year and a half. It becomes a life of an electrode in one year and a half for 24 hours per day at the time of the electrolytic current 10A. Exhausting of an electrode is changes by machine running time or electrolytic current.

When electrode exchange preset value reached take out a signal to EL control board TB4-3,4.

\* Please consult the selling company



## Chapter 5. Operational procedures

### Certain characteristics to be known about the ElectroLife device.

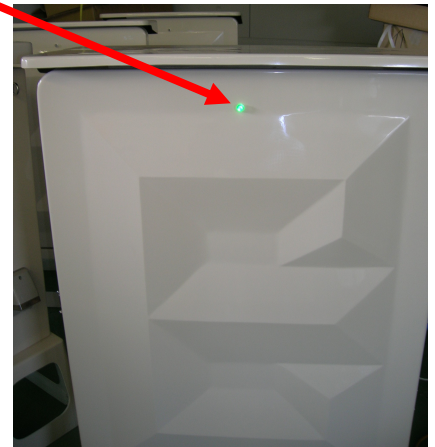
#### 5-1. Startup

Electrolysis starts automatically when the breaker switch is turned on.

#### 5-2. Display lamp

A status lamp is situated on the front door of the device.

Lamp Status	Description of Lamp Status
<b>OFF</b>	The device is either in an off or stopped mode.
<b>ON</b>	The device is in a normal operational mode.
<b>BLINKING</b>	The process has encountered an anomaly.



#### 5-3. Anomalous operation detection

If or when an anomalous condition is detected the device will stop automatically.

In this instance, an error condition will display on the LCD.  
The error codes along with its most-likely causes will appear as follows.

Error Code	Condition and Cause(s)
<b>ERROR 1</b>	<b>Condition:</b> The electrolysis voltage is operating at 2 or less volts. <b>Cause:</b> 1. Short circuit within the electrolysis chamber. 2. The Electrical Conductivity of the circulating water is high.
<b>ERROR 2</b>	<b>Condition:</b> The flow rate of water has gotten below 1 LPM of flow. <b>Cause:</b> 1. The external pump circulating the water is malfunctioning. 2. There could be a possible blockage in the waterway.
<b>ERROR 3</b>	<b>Condition:</b> The device does not detect an open signal from the Flood Valve. <b>Cause:</b> Malfunction with the Flood Valve.
<b>ERROR 4</b>	<b>Condition:</b> The device does not detect a close signal from the Flood Valve. <b>Cause:</b> Malfunction with the Flood Valve.
<b>ERROR 5</b>	<b>Condition:</b> The device does not detect an open signal from the Drain Valve. <b>Cause:</b> Malfunction with the Drain Valve.
<b>ERROR 6</b>	<b>Condition:</b> The device does not detect a closed signal from the Drain Valve. <b>Cause:</b> Malfunction with the Drain Valve.
<b>ERROR 7</b>	<b>Condition:</b> Temperature abnormality detection. <b>Cause:</b> Connected it with the high temperature line.
<b>ERROR 8</b>	<b>Condition:</b> The device does not detect a closed signal from the Flow Switch. <b>Cause:</b> 1. Malfunction with the Flow Switch.

## Chapter 6. Notes and Cautions

### 6-1 When operating the device:

1. The maximum current of the outlet for the external water pump is 2 Amps.
2. Please install a strainer between the external water pump and the device.

### 6-2 When installing the device:

1. Connect the ground wiring to terminals F and G located in the device.
2. Connect the input water, water outlet and drain outlet. Ensure that the connections are leak free.
3. Do not place any objects of the device.
4. Do not apply any vibration to this device.
5. Follow the instructions in the User's Manual.

### 6-3 When storing or transporting:

When this device needs to be stored for a period of time.

1. Ensure that all water has been removed from the device.
2. Do not store the device in an area that has sub zero temperature.
3. Do not store the device in a humid place
4. Do not store the device in an area with temperatures exceeding 40°C/104°F.

**Manufactured by: Innovative Design and Technology**

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