

# Ion Endeavor® Pump Controller

Digital Level Control with Pump Alternation  
and High Water Alarm

## OPERATION MANUAL

Dated: 02/18/2022

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**Note:** This product is intended to be installed by experienced professionals only.

**Note:** This product is required to plug into its own dedicated circuit, rated at the controller's required voltage and amperage.

**Note:** This product is for use with manual pumps only. A manual pump is a pump that runs when plugged into an outlet, regardless of the presence of water. Water sensor(s) are supplied with this unit for pump control.

## SAFETY PRECAUTIONS



**WARNING:** To prevent fire or shock hazard, do not expose this product to rain or moisture. This product has a NEMA-1 rated enclosure for use in an indoor environment. Never spill liquid of any kind on the product.



**DANGER:** Risk of electric shock. To reduce risk of electric shock, do not remove cover. There are no user-serviceable parts inside. Refer servicing to qualified service personnel.



**DANGER:** To prevent electric shock, ensure product is connected to a grounded outlet. The electrical outlet should be properly wired to a dedicated circuit breaker. Proper short-circuit and overload protection must be provided at the distribution panel. Install in accordance with all local and national electrical codes. Recommended mounting is above floor level. For best performance, do not use electrical extension cords.

## GENERAL OVERVIEW

The Ion® Endeavor is a pump controller that senses a water level of up to 72", has a configurable water level/pump turn-on setting, the ability to run two pumps simultaneously, pump alternation, pump failure sensing, local audible/visual alarm notification, local alarm silencing, and remote alarm notification.

### Indicators

The front panel has LEDs, a display, and an audible alarm to offer direct feedback to the user.

### Buttons

The front of the controller has buttons labeled "SILENCE", "RESET" and "PUMP TURN ON LEVEL".

The SILENCE button mutes the audible alarm when an alarm is active. Any future alarms will activate the audible alarm again.

The RESET button restarts the controller as if it were unplugged. At start up, the controller runs pump #1 temporarily, followed by the second pump, if it exists (as configured in the menu section).

The PUMP TURN ON LEVEL buttons set the water level at which the first pump turns on. It is measured in inches, up from the middle of the lower water sensor (see the Installation section). When the water level is pumped down to the middle of the lower water sensor, the pump is turned off. This setting *only* pertains to the lower water sensor.

## INSTALLATION

**NOTE: IF YOU ARE INSTALLING THE ENDEAVOR TO AN EXISTING SUMPRO MODEL 75, PLEASE CONTACT MANUFACTURER FIRST.**

1. See Figure 1, Page 2. Clamp the two water sensors to any riser pipes in the basin, one water sensor above the other, with one near the bottom of the pit and one at the very top. If only one sensor is supplied, mount it near the bottom of the pit. The bottom water sensor *must be mounted above all pump intakes* and will be used for day-to-day operation; the top one, if supplied, will be used as a backup for high water level sensing. Again, note that when the water is pumped down to the middle of the

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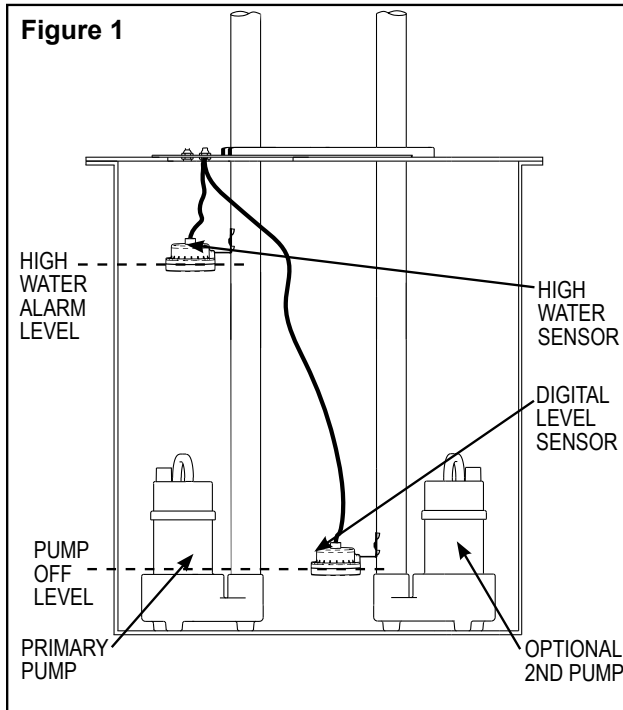
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lower water sensor, any running pump will turn off. If the water rises to the middle of the top water sensor, the controller will cue audible, visual, and any remote alarms indicating a high water level.

Figure 1



2. Mount the controller box to the wall in a place where its cord can reach a dedicated electrical outlet, and where the water sensors' and pumps' cords can reach the controller box.
3. Connect the water sensors to the controller box, ensuring that each sensor plugs into its correct connector; the lower sensor in the pit plugs into the DIGITAL LEVEL SENSOR jack and the higher sensor (if supplied) plugs into the HIGH WATER SENSOR jack.

(If only one sensor is supplied, disable the High Water Sensor as described in the Menu section.)

4. Plug the first pump into the outlet marked #1 on the controller box. If there is a second pump, plug it into the outlet #2 on the controller box.

(If only one pump is installed, properly set the controller's operating mode in the Menu section.)

## SETUP

Plug the controller into the electrical outlet on the wall. After it starts up, use the PUMP TURN ON LEVEL up buttons to set the desired water level (Setpoint) at which the first pump should turn on. This level is measured in inches, up from the middle of the DIGITAL LEVEL SENSOR. *This setting must be below the bottom of the HIGH WATER SENSOR.* When the water level is pumped down to the middle of the DIGITAL LEVEL SENSOR, any running pump is turned off.

**Note:** This setting only pertains to the DIGITAL LEVEL SENSOR, and will be retained in memory in the event of a complete power failure.

## MENU



**WARNING:** Changing these settings incorrectly may adversely affect pumping operation. If unsure about the settings, contact technical support.

The controller has a menu of user-configurable settings that may be altered if an unusual pump installation requires it; normally, these settings do not need to be changed. To enter this mode, press and hold the PUMP TURN ON LEVEL up button and PUMP TURN ON LEVEL down button together and then press the RESET button, then follow the instructions on the display. Note that once in the menu, pressing RESET button discards any changes. The individual settings are described below and, once saved, will be retained in the event of a complete power failure.

### Controller's Operating Mode

The Controller's Operating Mode can be set to one of four modes. "Duplex Similar" means the controller will run one or two pumps together as required. "Duplex Mixed" means the controller will run one or two dissimilar pumps (that is, each drawing much different current) as required. "Simplex Non-alternating" means there is only one pump installed and it is plugged into pump outlet #1. This allows a pump to be installed that uses the entire current available to the controller by the electrical outlet on the wall. "Simplex Alternating" means there are two pumps installed, but they will never run simultaneously. This, too, allows each pump to use the entire current available to the controller by the electrical outlet on the wall since

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the pumps will never be run together. The default is Duplex Alternating mode.

### Lag Start Level

The Lag Start Level is the number of inches *above* the Setpoint that was configured in the Setup section where the *second* pump will turn on. The default is 4 inches.

### Excess Run Time

The Excess Run Time is the number of minutes that a pump can run continuously before an alarm is initiated. This alarm feature can be turned off by setting it to zero. The default is 5 minutes.

### Emergency Run Time

The Emergency Run Time is the minimum number of seconds a pump(s) will run when water has reached the HIGH LEVEL SENSOR. The default is 10 seconds.

### High Water Sensor Enable

The High Water Sensor Enable tells the controller whether to use water level readings from the HIGH LEVEL SENSOR. The default is Enabled.

## OPERATION

The controller will turn one pump on whenever the water level rises above the Setpoint that was configured in the Setup section. If the water continues to rise a few inches above that height (as configured in the Menu), a second pump will be turned on, if it is present and the controller is set to run in duplex mode (see the Menu section). Any running pump will be turned off after the water level is pumped down to the middle of the DIGITAL LEVEL SENSOR.

**Note:** The controller will operate based on what it is set to as described in the Menu section, under "Controller's Operating Mode".

Under any of the following conditions, the controller will enter a state of alarm:

- A pump failure has been detected
- The water level reaches the HIGH LEVEL SENSOR
- A water level sensor has failed

- A pump has been continuously running but the water level remains above the DIGITAL LEVEL SENSOR for an extended period of time (as determined by the Menu setting)

Once in an alarm state, the controller will notify the user that there may be trouble by:

- Initiating audible and visual cues
- Breaking (electrically opening) the remote alarm contacts which can be connected to another alarming device, allowing it to inform the user remotely (these contacts are normally closed)
- Communicating the alarm to an optional internal alarm module for further handling

## PUMP FAULT DESCRIPTION

The controller determines pump condition via its built-in electrical current sensor. Whenever a pump draws abnormal current, the controller enters a state of alarm telling the user that pump service is needed. The following charts (**See Figures 2 through 5, Page 4-5**) describe these conditions. An "X" means behavior occurs for a particular pump state.



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**Figure 2: Duplex Operation – 2 pumps with similar current draw installed; both intended to run simultaneously when required.**

| Number of Pumps Running | Current          | Duplex Pumping Locked Out* | Duplex Pumping Forced Off† | Pump        |      | Alternate To Next Pump | Beep | Open Remote Alarm Contacts | LCD Updates |
|-------------------------|------------------|----------------------------|----------------------------|-------------|------|------------------------|------|----------------------------|-------------|
|                         |                  |                            |                            | Locked Out* | Bad‡ |                        |      |                            |             |
| 2                       | Extreme          | X                          | X                          |             |      |                        | X    | X                          | X           |
|                         | High, 3 Times    | X                          | X                          |             |      |                        | X    | X                          | X           |
|                         | High             |                            | X                          |             |      |                        |      | X                          | X           |
|                         | Low              |                            |                            |             |      |                        | X    | X                          | X           |
| 1                       | Critical         | N/A                        | N/A                        | X           |      | X                      | X    | X                          | X           |
|                         | Extreme, 3 Times | N/A                        | N/A                        |             | X    | X                      | X    | X                          | X           |
|                         | Extreme          | N/A                        | N/A                        |             |      | X                      |      | X                          | X           |
|                         | High, 3 Times    | N/A                        | N/A                        |             |      |                        |      | X                          | X           |
|                         | High             | N/A                        | N/A                        |             |      |                        |      | X                          | X           |
|                         | Low              | N/A                        | N/A                        |             |      | X                      | X    | X                          | X           |

**Figure 3: Duplex Mixed Operation – 2 pumps with dissimilar current draws installed; both intended to run simultaneously when required.**

| Number of Pumps Running | Current       | Duplex Pumping Locked Out* | Duplex Pumping Forced Off† | Pump        |      | Alternate To Next Pump | Beep | Open Remote Alarm Contacts | LCD Updates |
|-------------------------|---------------|----------------------------|----------------------------|-------------|------|------------------------|------|----------------------------|-------------|
|                         |               |                            |                            | Locked Out* | Bad‡ |                        |      |                            |             |
| 2                       | Extreme       | X                          | X                          |             |      |                        | X    | X                          | X           |
|                         | High, 3 Times | X                          | X                          |             |      |                        | X    | X                          | X           |
|                         | High          |                            | X                          |             |      |                        |      | X                          | X           |
|                         | Low           |                            |                            |             |      |                        | X    | X                          | X           |
| 1                       | Critical      | N/A                        | N/A                        | X           |      | X                      | X    | X                          | X           |
|                         | High, 3 Times | N/A                        | N/A                        | X           |      |                        | X    | X                          | X           |
|                         | High          | N/A                        | N/A                        |             | X    |                        |      | X                          | X           |
|                         | Low           | N/A                        | N/A                        |             |      | X                      | X    | X                          | X           |

**Figure 4: Alternating, Simplex Operation – 2 pumps installed, only one pump intended to run at one time.**

| Number of Pumps Running | Current       | Pump        |      | Alternate To Next Pump | Beep | Open Remote Alarm Contacts | LCD Updates |
|-------------------------|---------------|-------------|------|------------------------|------|----------------------------|-------------|
|                         |               | Locked Out* | Bad‡ |                        |      |                            |             |
| 1                       | Extreme       | X           |      | X                      | X    | X                          | X           |
|                         | High, 3 Times | X           |      | X                      | X    | X                          | X           |
|                         | High          |             | X    | X                      | X    | X                          | X           |
|                         | Low           |             |      | X                      | X    | X                          | X           |

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**Figure 5: Non-Alternating, Simplex Operation – 1 pump installed, only pump 1 will run. Pump 2 is disabled.**

| Number of Pumps Running | Current       | Pump        |      | Beep | Open Remote Alarm Contacts | LCD Updates |
|-------------------------|---------------|-------------|------|------|----------------------------|-------------|
|                         |               | Locked Out* | Bad† |      |                            |             |
| 1                       | Extreme       | X           |      | X    | X                          | X           |
|                         | High, 3 Times | X           |      | X    | X                          | X           |
|                         | High          |             | X    | X    | X                          | X           |
|                         | Low           |             |      | X    | X                          | X           |

\* Duplex Pump Mode or pump is permanently locked out from running until controller is reset.

† Running two pumps simultaneously is temporarily disabled; that is, one pump is turned off.

‡ Pump is only run as a lag (secondary) pump.

### SPECIFICATIONS

|                          |                                               |
|--------------------------|-----------------------------------------------|
| Remote Alarm Contacts:   | Normally Closed, 30 VAC/DC @ 1 A              |
| Temperature Range:       | -20 °C to 60 °C (-4 °F to 140 °F)             |
| Audible Alarm:           | > 90 dB at 2 feet                             |
| Enclosure:               | NEMA-1 Polycarbonate                          |
| Dimensions (controller): | 8" x 6" x 4"                                  |
| Dimensions (sensors):    | 4.62" x 4.62", mounting straps: 5.25" x 3.50" |
| Mounting:                | Up to #10 screws                              |

| Maximum Output |                    |
|----------------|--------------------|
| Model 200-AU   | 200-240 VAC @ 8A   |
| Model 200-15   | 200-240 VAC @ 12 A |
| Model 100-15   | 120 VAC @ 12 A     |
| Model 100-20   | 120 VAC @ 16 A     |

### TROUBLESHOOTING

**Pump won't turn on before reaching the HIGH WATER SENSOR.**

Setpoint is set too high.

**The controller keeps reporting a water sensor failure when there is only one sensor installed.**

Make sure the HIGH WATER SENSOR is disabled using the Menu as described above.

**The controller keeps reporting a water sensor failure.**

Make sure each is plugged into its correct jack in the controller box (see Installation section). Swapping plugs may isolate the failed sensor.

**Pump won't turn off even though pit is empty.**

The lower sensor ("DIGITAL LEVEL SENSOR") must be mounted above all pump intakes.

**The newly added optional alarm module doesn't work.**

Enable the optional alarm module using the Menu settings (see Menu section). If still inoperative, contact technical support to determine whether the Endeavor has the software version (shown after pressing RESET) that supports the new module.

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### 3 Year Residential Warranty

1. Coverage and Term. Metropolitan Industries, Inc. ("Metropolitan") warrants to the original purchaser (the "Buyer") of each Ion® product (the "product"), that any part thereof which proves to be defective in material or workmanship within three (3) years from date of manufacture, will be replaced at no charge with a new or remanufactured part, F.O.B. factory. Buyer shall be responsible for all freight charges and all costs of field labor or other charges incurred in the removal and/or reinstallation of any product, part or component thereof.

2. Exclusions. **THE WARRANTY IS SUBJECT TO THE FOLLOWING CONDITIONS AND EXCLUSIONS:**

(a) The Warranty excludes products or workmanship which becomes defective as a result of: (i) earthquake, fire, storms, the elements or any other acts of God; (ii) normal wear and tear from use; (iii) accident, misuse, abuse or neglect; (iv) modifications made by Buyer or any third party, other than **Metropolitan**; and (v) Buyer's failure to properly install, maintain, service and/or operate the product under normal conditions and according to manufacturer's instructions.

(b) **Metropolitan** shall not be responsible for, and the Warranty shall not cover, extended damage which occurs because of Buyer's failure to notify **Metropolitan** promptly in writing of apparent defects.

(c) Any part or component designated as manufactured by anyone other than **Metropolitan** shall be covered only by the express warranty of the manufacturer thereof.

(d) The Warranty shall lapse upon Buyer's failure to fully comply with the terms and conditions of its contract with **Metropolitan**, including Buyer's failure to pay the purchase price for the product or any portion thereof. Buyer's subsequent compliance with the terms and conditions of any such contract, will not cause the term of the Warranty to extend beyond the time period set forth above.

(e) No actions taken by **Metropolitan** to correct a defect in a product shall extend the Warranty beyond the period set forth above. **Metropolitan** shall not be obligated to remedy any defect, where otherwise required pursuant to the Warranty unless and until Buyer notifies **Metropolitan** in writing of the defect and then only if such notification is made prior to the expiration of the period set forth above.

3. Process of Claims and Repairs. **Metropolitan** agrees that if the product or any part or component thereof shall fail to conform to the terms of this Warranty, **Metropolitan** shall replace such nonconforming product, part or component at the original point of delivery and furnish instruction for its disposition. Any transportation charges involved in such disposition and all costs of field labor or other charges incurred in the removal and/or reinstallation of any product, part or component thereof shall be the responsibility of Buyer.

4. Limitation on Liability. Notwithstanding any provision to the contrary, **Metropolitan's** entire liability under this Warranty shall not in the aggregate exceed, and Buyer's exclusive and sole remedies are, to the extent permitted by law, shall be to secure replacement of the defective product. **UNDER NO CIRCUMSTANCES SHALL METROPOLITAN BE LIABLE UNDER THE WARRANTY FOR ANY INDIRECT, PUNITIVE, SPECIAL, EXEMPLARY, CONSEQUENTIAL OR INCIDENTAL DAMAGES (INCLUDING LOST PROFITS, REVENUE, USE OR ECONOMIC ADVANTAGE).**

5. Express Waiver of Any Other Warranties. **THE EXPRESS WARRANTY SET FORTH IN THIS WRITTEN WARRANTY IS THE ONLY WARRANTY MADE BY METROPOLITAN, OR ANY OTHER PARTY, IN CONNECTION WITH ANY PRODUCT PURCHASED FROM METROPOLITAN. NEITHER METROPOLITAN, NOR ANY OTHER PARTY, MAKES ANY OTHER EXPRESS OR IMPLIED WARRANTY WHICH IS NOT SET FORTH HEREIN, AND METROPOLITAN HEREBY DISCLAIMS AND BUYER HEREBY WAIVES ALL IMPLIED WARRANTIES, INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY AND THE IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.**

6. Not Transferable. The Warranty may not be transferred and shall be void on the sale or other transfer of the product.

7. Products and Warranty Subject to Change. **Metropolitan** reserves the right to make revisions to its products and their specifications, and to revise this Warranty and related information without notice.