Aerobic Treatment Control Panel · Demand + UV

120 VAC · Single Phase | Demand Dose · UV Disinfection | Failsafe Lockout

ENGINEERED & MANUFACTURED FOR AKHA MANUFACTURING, LLC · HYDRO-ACTION® SYSTEMS

DOCUMENT VERSION **2.0 (Full)**
DATE **July 2026**
MODEL **CP-001-3-0003**
UL FILE NUMBER **E547664**
PREPARED BY **Legacy Controls · 6200 FL-46, Mims, FL 32754**
COMPLIANCE **UL 508A · NSF/ANSI 40**
SYSTEM PLATFORM **Hydro-Action®**
WEB **hydro-action.com**

PRODUCT OVERVIEW

The CP-001-3-0003 is a UL 508A Listed control panel for NSF/ANSI 40 residential and light commercial aerobic treatment systems with integrated UV disinfection. It powers and supervises the aeration compressor, continuously powers and monitors the UV lamp through a PRI-51/1 current monitoring relay, and controls a demand-dose effluent pump through customer-supplied floats. Protection is failsafe: air pressure loss or UV lamp failure raises the alarm and locks out the demand pump to prevent discharge of under-treated effluent, while high water raises the alarm without interrupting the pump — so the panel keeps moving water down when treatment is healthy. A dedicated control circuit keeps the alarm system live even when the main breaker is off.

IMPORTANT NOTICE — SUPPORT & WARRANTY ADMINISTRATION

This control panel is manufactured by Legacy Controls for AKHA Manufacturing, LLC and is intended for use with Hydro-Action wastewater treatment systems. **ALL technical support, warranty claims, service questions, callbacks, and customer communications must be directed to AKHA Manufacturing, LLC.**

AKHA Manufacturing, LLC · 2055 Pidco Dr. / P.O. Box 640, Plymouth, Indiana 46563
Toll Free 800-370-3749 · Phone (574) 936-2542 · Fax 574-936-2298 · hydro-action.com

Legacy Controls provides manufacturing and warranty support to AKHA Manufacturing, LLC and does not accept direct inquiries or claims from end users or installers for this product line.

⚠ READ FIRST — CONTROL CIRCUIT

This panel is fed by **TWO separate 120 V circuits**: main power and a dedicated control circuit that keeps the alarm system powered during main power loss. The control circuit **remains energized even when the main breaker is OFF** — disconnect **BOTH** feeds and verify with a voltage tester before opening the panel. Neutrals from both feeds **must land on the same neutral bus** in the feeder panel.

TABLE OF CONTENTS

1 Safety Instructions
2 Specifications
3 Installation Instructions
4 Wiring and Connections
5 Operation
6 PRI-51 Current Monitor Programming
7 Maintenance
8 Troubleshooting
9 Warranty

1. SAFETY INSTRUCTIONS

WARNING **Risk of electric shock and serious injury.** This control panel contains two separately fed 120 V circuits. Improper handling can result in serious injury, death, electrical shock, fire, or equipment damage. Only qualified personnel familiar with local electrical codes (NEC), UL 508A standards, and onsite wastewater treatment systems should install, operate, or maintain this panel.

Critical Safety Requirements

- **Power Off Procedures —** Disconnect BOTH the main breaker and the control circuit feed before opening the panel or performing any wiring, and use proper lockout/tagout procedures. The control circuit remains energized when the main breaker is off. Always verify with a voltage tester.
- **Failsafe Lockouts —** Never override the air loss or UV fault lockouts under any circumstances. They exist to prevent discharge of under-treated effluent.
- **UV Lamp —** Handle and dispose of UV lamps according to local regulations. Never look directly at an energized UV lamp.
- **Grounding —** Ensure proper grounding of the panel and all connected equipment per NEC requirements.
- **Overload Protection —** All motors must incorporate internal overload protection. The control circuit shall not exceed 5 A.
- **High Water Alarm —** If the high water alarm activates, investigate immediately to prevent system backup or overflow.
- **PPE —** Wear insulated gloves, safety glasses, and appropriate protective clothing when working near electrical components or the treatment plant.
- **Field Wiring —** Use 26–10 AWG copper conductors rated 600 V, 60 °C minimum. Torque all terminal screws to 4.425 in-lbs (0.50 N·m).
- **Unauthorized Modifications —** Any alteration, modification, or unauthorized repair will void the UL listing, the manufacturer's warranty, and may create serious safety hazards.

CAUTION A main panel disconnect switch must be supplied and installed in the field. Always verify with a voltage tester before working inside the panel.

2. SPECIFICATIONS

Panel Identification & Electrical Ratings

PARAMETER	SPECIFICATION
Model	CP-001-3-0003
UL File Number	E547664
Supply	120 VAC, 60 Hz, single phase — dual feeds: main power + dedicated control circuit
Total FLA	25 A
Compressor Circuit	120 V, ½ HP max (10 FLA) — internal overload protection required
Demand Pump Circuit	120 V, 1 HP max (15 FLA) — largest motor
UV Ballast	Electronic, 25–35 W · Type P (outdoor) · inherent thermal protection · 600 V max
Feeder Protection (Field Supplied)	Upstream, at the feeder panel (not in this panel): main power 20–30 A · control circuit 5 A max
SCCR	5 kA
Alarm System	Red beacon + 95 dB horn with silence push-button — powered by the control circuit
Protection Logic	Failsafe demand-pump lockout on air pressure loss or UV lamp fault · high water raises the alarm only
Enclosure	NEMA 4X polycarbonate — indoor or weatherproof outdoor
Field Wiring	26–10 AWG copper, 600 V, 60 °C · terminal torque 4.425 in-lbs (0.50 N·m)
Operating Temperature	–20 °C to 50 °C
Compliance	UL 508A Listed · NSF/ANSI 40

Key Components

PARAMETER	SPECIFICATION
PRI-51/1 Current Monitoring Relay	Continuously monitors UV lamp current — lamp failure or end-of-life triggers alarm and demand pump lockout (see Section 6)
Air Pressure Switch (N.O.)	Verifies compressor operation — loss of pressure triggers alarm and demand pump lockout
High Water Alarm Float (N.O.)	Activates the alarm — pump operation is unaffected
UV Ballast & Lamp	Provides final effluent disinfection — lamp is customer-supplied and field-installed
Demand Dose Floats	Customer supplied — call the demand pump on liquid level
Control Circuit	Dedicated 120 V feed — keeps the alarm system live during main power loss
Motor Contactor & Overload	Switching and protection for the demand-dose pump

3. INSTALLATION INSTRUCTIONS

WARNING Installation must be carried out by qualified personnel only. Follow local electrical codes (NEC) and consult the panel schematic and connection diagram.

1. **Mounting —** Secure the NEMA 4X enclosure to a stable vertical surface in a location protected from direct weather and physical damage.
2. **Power Supply —** Bring two separate 120 V circuits from the feeder panel: main power (20–30 A) and a dedicated control circuit feed (5 A max). This is feeder protection at the main panel, not part of this panel. Install a field-supplied main disconnect switch upstream.
3. **Control Circuit —** The dedicated 120 V feed keeps the alarm system operational if the main breaker trips. Neutrals from both feeds must land on the same neutral bus in the feeder panel. It is advised to supply the control circuit from the same branch circuit as a commonly used household item — a frequently used light or receptacle — so that a loss of power to the alarm circuit is noticed promptly.
4. **Field Wiring —** Use 26–10 AWG copper conductors rated 600 V, 60 °C minimum and wire all field devices exactly as shown on the terminal connection diagram. Torque all terminal screws to 4.425 in-lbs (0.50 N·m).
5. **Float Installation —** Install the customer-supplied demand dose float(s) and the high water alarm float. All floats are normally open (N.O.) type. Position the high water float above the dose float(s).
6. **UV Lamp —** Install the customer-supplied UV lamp into the ballast socket per the lamp manufacturer's instructions before energizing.
7. **Sealing —** Verify all conduit entries are properly sealed to preserve the Type 4X rating.
8. **Commissioning Test —** Energize the control circuit, then main power. Confirm the compressor starts and the UV lamp powers (allow 1–2 minutes warm-up). Test every protection before leaving the site: interrupt the airline (alarm + pump lockout), interrupt the UV lamp (alarm + lockout), and lift the high water float (alarm annunciation — pump operation unaffected). Verify the silence push-button.

4. WIRING AND CONNECTIONS

Refer to the CP-001-3-0003 Line Drawing v1.2 and Connection Diagram v1.3.3 (reproduced on the following pages for reference) for complete wiring details.

Main Power & Control Circuit Feed

Connect main power and the dedicated control circuit feed as shown on the schematic. Main power supplies the compressor, UV ballast, and demand-pump circuit; the control circuit powers the alarm system and shall not exceed 5 A.

SAFETY NOTE Neutrals from the separate power and control circuit feeds ***must*** be landed on the same neutral bus in the feeder panel to maintain equipotential bonding, ensure an adequate fault-current return path for proper overcurrent device operation, and prevent neutral overload or hazards due to miswiring.

Field Connections

- Aeration compressor — 120 V, ½ HP max (10 FLA)
- Demand-dose pump — 120 V, 1 HP max (15 FLA), through the motor contactor and overload
- Demand dose float(s) — customer supplied, normally open
- High water alarm float — customer supplied, normally open
- UV ballast and lamp — lamp customer supplied, field installed in the ballast socket
- Alarm devices — red beacon and horn on the control circuit

WARNING Verify all connections match the schematic before energizing. Incorrect wiring can cause faults or create safety hazards.

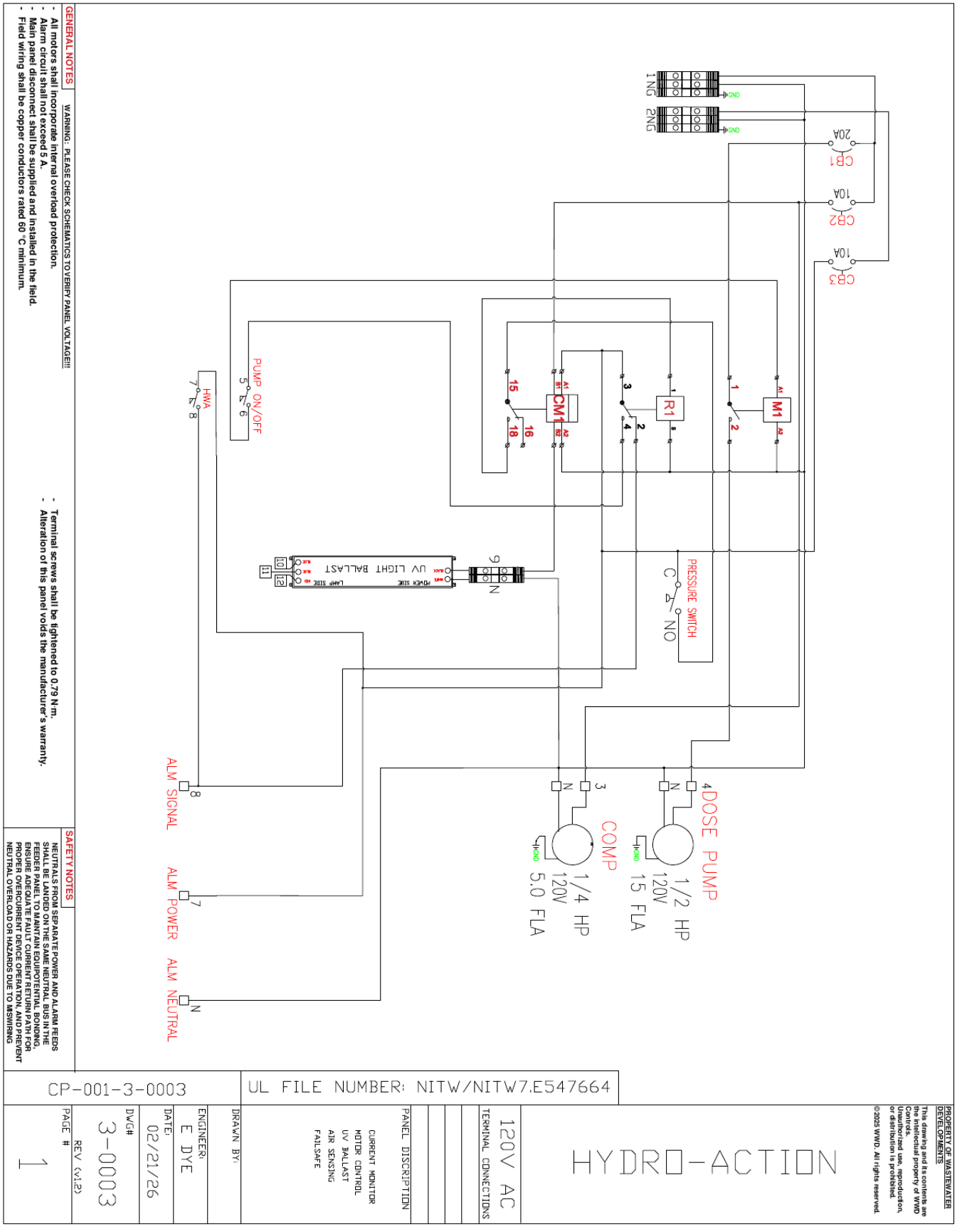

FIGURE 1 — LINE DRAWING v1.2 (REFERENCE)

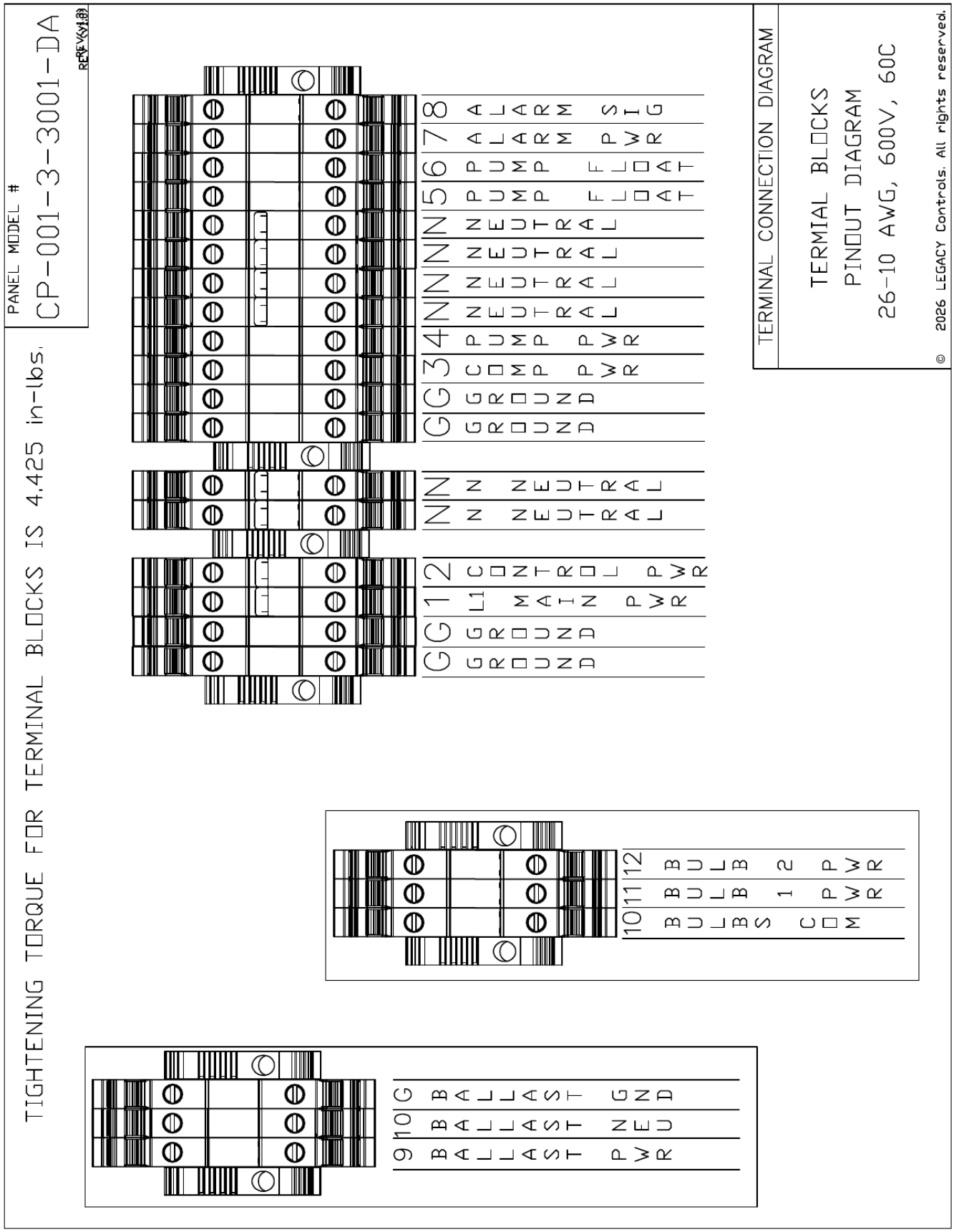

FIGURE 2 — CONNECTION DIAGRAM v1.3.3 (REFERENCE)

5. OPERATION

System Initialization

Verify all field wiring against the connection diagram and confirm the UV lamp is installed. Energize the control circuit feed, then main power. The compressor starts immediately and runs continuously; the UV lamp powers and may require 1–2 minutes of warm-up. The demand pump remains idle until its float calls for a dose.

Normal Operation

The compressor runs continuously whenever main power is present, verified by the air pressure switch. The UV lamp is continuously powered and supervised by the PRI-51/1 current monitor. The demand-dose pump runs on float demand — unless a failsafe lockout is active. With no faults present, the beacon is off and the horn is silent.

Alarm & Lockout Behavior

CONDITION	DETECTED BY	PANEL RESPONSE
Air pressure loss	Air pressure switch (N.O.)	Alarm · demand pump LOCKED OUT
UV lamp fault / end-of-life	PRI-51/1 current monitor	Alarm · demand pump LOCKED OUT
High water	High water float (N.O.)	Alarm only — pump operation unaffected; the pump continues lowering the level
Main power loss	—	Alarm system remains live on the control circuit feed

FAILSAFE PROTECTION Air loss and UV fault lock out the demand pump so under-treated effluent cannot be discharged; lockouts clear automatically when the condition is corrected, and must never be bypassed. High water is intentionally alarm-only — when treatment is healthy, the panel keeps pumping to bring the level down.

6. PRI-51 CURRENT MONITOR PROGRAMMING

MANUFACTURER DOCUMENTATION **Elko EP PRI-51 Manual**
Scan for the official manufacturer document with complete functions, ranges, and wiring detail — elkoepna.com · PRI-51.pdf

The PRI-51/1 current monitoring relay supervises the UV lamp by measuring its operating current. While the lamp draws normal current the relay holds engaged; a failed lamp, an end-of-life lamp drawing degraded current, or a disconnected lamp drops the relay, which raises the alarm and locks out the demand pump.

Field Adjustment

Adjustment is only required after replacing the UV lamp or ballast with a different type:

9. Install the new lamp and energize the panel. Allow the lamp 1–2 minutes to warm up and stabilize.
10. Adjust the current threshold potentiometer so the relay holds reliably engaged with the lamp operating normally — the relay LED indicates the engaged state.
11. Verify detection: interrupt the lamp and confirm the relay drops, the alarm activates, and the demand pump locks out.
12. Restore the lamp and confirm the alarm clears and the lockout releases.

FACTORY CALIBRATION The PRI-51/1 is calibrated at the factory for the supplied ballast and lamp type. Do not adjust the threshold during routine service — only after a lamp or ballast replacement, and only per the procedure above.

7. MAINTENANCE

Recommended service intervals below, or immediately upon any alarm condition. Record all readings and adjustments on the maintenance log.

INTERVAL	TASK
As required	Replace the UV lamp when disinfection degrades or a UV fault occurs — handle and dispose of lamps per local regulations
Biannually	Clean the compressor intake filter · verify air pressure switch operation
Biannually	Test the alarm beacon, horn, and silence push-button · inspect enclosure seals and latches
Annually	Re-torque all terminal screws to 4.425 in-lbs (0.50 N·m)
Always	Keep the enclosure door closed and fastened

OPERATOR NOTE Respond immediately to any audible or visual alarm, and silence the horn only after acknowledging the fault light. Never override the air loss or UV fault lockouts.

8. TROUBLESHOOTING

Preliminary checks: verify both power feeds are live and identify which fault light is illuminated before working through the matrix below.

SYMPTOM	POSSIBLE CAUSE	ACTION
No lights, no compressor, no alarm	Main power loss	Check the feeder breaker and incoming voltage
Alarm active, no main lights	Main breaker tripped — control circuit still live	Reset the main breaker and investigate the overload
UV fault light	Lamp failed or end-of-life; current monitor adjustment	Replace the UV lamp; verify PRI-51 setting per Section 6
Compressor fault	No air pressure, blocked airline, or faulty switch	Inspect the airline, compressor, and pressure switch
High water in tank	Tank over-full, pump failed, or discharge restricted	Verify the pump is running to lower the level; investigate influent/effluent restrictions
Demand pump will not run	Failsafe lockout active (air or UV) or no dose signal	Clear the lockout condition, then check the dose floats, pressure switch, and UV lamp
Horn will not silence	Silence button wiring or relay failure	Verify the silence circuit; contact AKHA Manufacturing

IF ISSUES PERSIST Contact AKHA Manufacturing, LLC with the model and serial number — Toll Free 800-370-3749 · Phone (574) 936-2542 · hydro-action.com

9. WARRANTY

Definitions

For the purposes of this Limited Warranty:

- **“Product”** refers to the UL Listed industrial control panel manufactured by Legacy Controls, including all components, assemblies, and associated hardware as originally supplied.
- **“Defect”** means a failure of the Product to conform to Legacy Controls’ published specifications due to faults in materials or workmanship under normal use and service.
- **“Authorized Service Provider”** means Legacy Controls or its designated dealers, distributors, or repair facilities authorized in writing by Legacy Controls.
- **“Original Purchaser”** means the end-user who first purchases the Product from Legacy Controls or an authorized dealer/distributor for use, not resale.
- **“Warranty Period”** means the period of two (2) years commencing from the date of original purchase as evidenced by valid proof of purchase.

Warranty Statement

Legacy Controls warrants to the Original Purchaser that the Product will be free from Defects in materials and workmanship for the Warranty Period when used in accordance with the instructions provided in this operation manual, the accompanying panel schematic and connection diagram, and applicable UL standards (including UL 508A for industrial control panels). This Limited Warranty is non-transferable and applies only to the Original Purchaser. It does not extend to any subsequent owners or users.

Coverage

If a Defect occurs during the Warranty Period, Legacy Controls or an Authorized Service Provider will, at its sole discretion, repair or replace the defective Product or component. Repaired or replaced Products or components are warranted for the remainder of the original Warranty Period or ninety (90) days from the date of repair or replacement, whichever is longer.

Exclusions & Limitations

This Limited Warranty does not cover damage or failure resulting from misuse, abuse, negligence, improper installation or maintenance, alterations by unauthorized parties, normal wear and tear, cosmetic damage, environmental deterioration, external factors, or products purchased from unauthorized sellers. Consumable items such as fuses, bulbs, and UV lamps are excluded unless the defect is due to manufacturing workmanship. Liability is limited to the original purchase price. TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, LEGACY CONTROLS SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, INDIRECT, SPECIAL, PUNITIVE, OR EXEMPLARY DAMAGES.

Making a Warranty Claim

CLAIMS ADMINISTRATION All warranty claims must be submitted through AKHA Manufacturing, LLC, using the contact information in the Important Notice at the beginning of this manual. Legacy Controls provides warranty support to AKHA Manufacturing, LLC as the authorized supplier.

Submit claims with proof of original purchase, the model number, and a detailed description of the issue. The Product will be inspected to verify the Defect and eligibility, and the Original Purchaser will be notified of the results and proposed resolution within a reasonable time, typically within thirty (30) days of receipt.

Component Substitution

Legacy Controls reserves the right to substitute any control panel component with an alternative meeting equivalent specifications, including identical operational parameters and performance standards. Legacy Controls assumes full responsibility for the functional performance of any such substitution and for its continued compliance with all applicable regulatory and operational requirements.

Governing Law

This Limited Warranty shall be governed by the laws of the State of Florida. Any disputes shall be resolved exclusively in the state or federal courts located in Brevard County, Florida.