

Nitrogen Reduction Control Panel

Device-Classified Troubleshooting | 120 VAC · Timer-Based Process Control | UL 508A Listed

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

DOCUMENT VERSION 2.0

DATE August 2026

MODEL / PANEL REVISION CP-001-1-0001 · Rev v6.1

UL FILE NUMBER E547664

SOURCE Master Troubleshooting Matrix v1.1 (Working Draft)

COMPANION TO Operation Manual v4.3

MANUFACTURED FOR AKHA Manufacturing, LLC · Plymouth, Indiana

SUPPORT & WARRANTY AKHA Manufacturing · 800-370-3749

This guide covers the device classes present in this panel: incoming power and the isolated control circuit, timers and schedulers (T1 · T2), current monitoring (PRI-32), compressor and air pressure, float switches, motor contactors, motor-integral overloads, failsafe lockouts, and the alarm circuit. Work top to bottom within the section that matches the symptom. De-energize ALL power sources — including any separate isolated control-circuit feed — and verify with a voltage tester before opening the panel.

⚠ ONLY M3 EVER LOCKS OUT · HIGH WATER IS ALARM-ONLY · NO OVERLOAD DEVICES

Two conditions create a lockout — low air pressure and recirculation failure — and the only output locked out is the demand dose pump (M3). High water raises the alarm and never locks anything out: a high-water event means M3 is not keeping up, and shutting it off is the last thing the system needs. Overload protection is integral to the motors — there is nothing in the panel to reset.

POWER & FEEDS — ISOLATED CONTROL CIRCUIT

SYMPTOM	POSSIBLE CAUSE	ACTION
No lights, no loads, no alarm	Loss of incoming power · feeder breaker off · loose connections	Verify the feeder breaker, incoming voltage at the panel terminals, and connection torque (0.79 N·m (7.0 in-lbs))
System will not start	Isolated control circuit not powered — jumper removed without a separate feed landed	Verify the jumper between terminals 1 and 2, or that the dedicated feed is landed and energized
Circuit live after main shutoff	Separate isolated feed in use — it stays energized when the main feed is off	Disconnect ALL power sources before service; this is expected behavior, not a fault

TIMERS & SCHEDULERS — ELKO CRM-2H (T1) · ELKO CRM-183J/UNI (T2)

SYMPTOM	POSSIBLE CAUSE	ACTION
Timer sync failure	T1/T2 out of sync · enable float not triggering T1	Press the Pump Test button once the enable float activates T1; T1 does not start timing until the float rises
Recirculation failure alarm with a healthy pump	T2 countdown set shorter than T1's OFF time	T2 must be set longer than T1 OFF; verify both against the GPD tables in Operation Manual Section 6
Recirculation volume wrong for the plant	T1 range or potentiometer values do not match plant capacity	Re-set T1 per the GPD cheat sheet (450–1,100 GPD) in Operation Manual Section 6

CURRENT MONITORING — ELKO EP PRI-32 (CS)

SYMPTOM	POSSIBLE CAUSE	ACTION
Recirculation failure alarm, pump appears to run	CS threshold set above the pump's actual running draw	Observe the CS signal while the pump runs; recalibrate to trip at the normal running draw (~6–8 A)
No failure alarm when the pump is dead	CS threshold set too low · supply conductor not routed through the current transformer	Verify the conductor passes through the PRI-32 CT; recalibrate the threshold
Alarm after pump or relay replacement	Threshold still set for the previous pump	Recalibrate — adjust only after pump or relay replacement, never during routine service

COMPRESSOR & AIR PRESSURE

SYMPTOM	POSSIBLE CAUSE	ACTION
Low air pressure alarm + M3 lockout	Air pump failure · leak · blocked line · failed pressure switch	Inspect the air pump and lines end-to-end; test the pressure switch; the lockout releases when pressure is restored
Demand dose failure	M3 wiring · active lockout	Verify lockout status first, then test the pressure switch and M3 wiring

FLOAT SWITCHES

SYMPTOM	POSSIBLE CAUSE	ACTION
System not starting, no recirculation	Enable float down, obstructed, or failed	Verify tank level; manually actuate the float; inspect the cable for damage
Alarm triggers intermittently	Float cable damage · obstruction · turbulence	Inspect and replace the float or cable as needed
High water alarm active	Demand dose pump not keeping up · inflow exceeding capacity · restricted discharge	M3 is never interrupted by high water — verify it is running, check for an active air or recirculation lockout, then investigate inflow and discharge

MOTOR CONTACTORS & OVERLOADS

SYMPTOM	POSSIBLE CAUSE	ACTION
Controls fine, a pump does not run	Contactors coil failure · coil circuit wiring · active lockout (M3 only)	Clear any lockout first; inspect the contactor, verify coil voltage, and check wiring per the schematic
Pump stops, restarts after cooling	The motor's integral overload tripped	Let the motor cool; investigate supply voltage, impeller binding, and run conditions — there is no overload device in the panel to reset

FAILSAFE LOCKOUTS

SYMPTOM	POSSIBLE CAUSE	ACTION
M3 will not run, alarm active	Low air pressure or recirculation failure lockout active	Clear the fault condition — the lockout releases automatically; never bypass a lockout
M3 locked out AND high water active	Concurrent conditions — the lockout source is the air or recirculation fault, never the high water	Clear the air or recirculation fault; treat the high water as a separate alarm-only condition

ALARM CIRCUITS

SYMPTOM	POSSIBLE CAUSE	ACTION
Alarm will not activate	Float or alarm circuit fault	Manually lift the high-water float; verify the alarm circuit and the isolated control circuit
Alarm will not clear	Underlying lockout condition still present	Identify which condition is active — air pressure, recirculation failure, or high water — and resolve it; lockouts release automatically

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**

© 2026 LEGACY CONTROLS. All rights reserved. Generated from the Legacy Controls Master Troubleshooting Matrix v1.1 (Working Draft) — device classes filtered to this panel. New field issues are added to the Matrix first, then propagated to this guide at its next revision. Engineered and manufactured for AKHA Manufacturing, LLC · Plymouth, Indiana · hydro-action.com