Duplex Pump Control Panel — Three-Phase · Quick Start

230 VAC · 3-Phase | Duplex · Automatic Alternation | 3 HP · Float Control

DESIGNED & MANUFACTURED BY LEGACY CONTROLS · MIMS, FLORIDA · UL 508A LISTED

GUIDE VERSION **1.1**
MODEL **LC-9100 · 9000 Series Three-Phase Duplex**
FULL DOCUMENTATION **Operation Manual v1.1 · Spec Sheet v1.1**
DATE **August 2026**
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DRAWINGS **Schematic Set Sheets 1–5 · Rev C (As-Built)**

⚠ READ FIRST — 230 V 3-PHASE SUPPLY & CONTROL TRANSFORMER

This panel operates on 230 VAC three-phase — three phase conductors plus ground; no incoming neutral. The 120 V control circuit comes from control transformer T1, configured for a 230 V primary (jumpers H1–H3 and H2–H4). Verify the jumpers and confirm supply voltage with a voltage tester before energizing. **Verify pump rotation before placing the panel in service.**

1. BEFORE YOU ENERGIZE

1. **Mount —** secure the NEMA 4X enclosure (Polycase ZH-161407) to a stable vertical surface with clearance for the door and service access.
2. **Verify the transformer —** T1 primary jumpers H1–H3 and H2–H4 (230 V), with all fuses installed: F1/F2 1.25 A time-delay primary · F3 2 A alarm · F4 2 A control.
3. **Set the overloads —** dial each overload relay (9–12.5 A range) to the pump motor nameplate FLA — 3 HP pumps: 9.6 A.
4. **Land the pumps —** Pump 1 leads on terminals 4 / 5 / 6 plus ground · Pump 2 leads on terminals 7 / 8 / 9 plus ground.
5. **Install the floats —** N.O. floats lowest to highest: Off · On · Both-Pump · High Water Alarm. Terminal pairs: Off on 12 & 13 · On on 10 & 11 · Both-Pump on 14 & 15 · High Water Alarm on 16 & 17 — the Off float (lowest) lands on the higher-numbered pair. Every float gets its own terminal pair; never piggyback float leads.
6. **Torque & feed —** copper conductors, 60 °C minimum — DK4N field terminals 5.3 in-lbs (0.6 N·m); DK10N power terminals per the block marking. Feeder protection is field supplied at the main panel, with a main disconnect switch upstream.

2. START-UP & FUNCTIONAL TEST

1. **Check rotation —** bump each pump briefly in HAND and verify correct rotation. If reversed, de-energize, lock out, and swap any two phase conductors at that pump's load terminals — never at the incoming feed.
2. **Energize —** set both pump selectors to AUTO — with no faults present the alarm globe is off and both pumps are idle.
3. **Cycle the floats —** raise the On float — the lead pump starts, seals in for full drawdown, and stops when the level drops below the Off float. Confirm the lead/lag designation alternates after each cycle.
4. **Test high demand —** lift the Both-Pump float — both pumps run together until the level drops (pumps in AUTO only).
5. **Test the alarm —** lift the High Water Alarm float — the red globe and buzzer annunciate with NO pump action. Press the test pushbutton, then verify the silence switch: buzzer silences, globe stays lit. Return both selectors to AUTO before leaving.

3. ALARMS & INDICATORS

- **Green run lights —** illuminate whenever the respective pump is running.
- **Red globe + buzzer —** high water — driven by the highest float on its own fused alarm branch (F3, which also feeds the Both-Pump float); it calls no pump. The silence switch interrupts the buzzer only; the globe stays lit until the level clears.
- **Overload trip —** stops that pump with no alarm — a rising level brings the Both-Pump float, then the alarm float, into play. Identify and correct the cause before resetting the overload.

4. FACTORY SETTINGS — QUICK CHECK

TELE E1ZMLA10 load alternator — ships factory-configured; verify at commissioning and after any component replacement:

- **Function —** selector (P1) set to LA (Load Alternator) BEFORE energizing — the output transfers 18 ↔ 16 each time B1 is energized, so the lead pump swaps every pump-down cycle. The output common (15) is fed by the pump call, never from constant 120 V.
- **Delay —** both time knobs (P2 range, P3 value) fully counter-clockwise for the standard minimum ≈ 50 ms de-bounce.
- **Verify —** green U/t LED confirms supply; yellow R LED illuminated = Pump 2 is the selected pump. L1 / L2 manual modes are for service only — return the selector to LA.
- **Overloads & fuses —** overload dials at 9.6 A · F1/F2 1.25 A time-delay primary · F3 2 A alarm · F4 2 A control.

5. SERVICE & SUPPORT

SERVICE & SUPPORT Contact the authorized dealer or installer who supplied your system for all technical support, service calls, alarm response, and warranty claims — their information is recorded on the Service & Support card at the front of the Operation Manual. **If your dealer cannot be reached, visit Legacy-Controls.com.**

LC-9100 DUPLEX PUMP PANEL — SCHEMATIC SET · TERMINAL DIAGRAM

INCOMING 230 V 3Ø				PUMP 1 (M1)				PUMP 2 (M2)			
G	**1**	**2**	**3**	**G**	**4**	**5**	**6**	**G**	**7**	**8**	**9**
DK10N-PE GND / PE	DK10N LEG 1	DK10N LEG 2	DK10N LEG 3	DK4N-PE P1 GND	DK4N M1 T1	DK4N M1 T2	DK4N M1 T3	DK4N-PE P2 GND	DK4N M2 T1	DK4N M2 T2	DK4N M2 T3

FLOATS — 4 × 2-WIRE, 120 V							
10	**11**	**12**	**13**	**14**	**15**	**16**	**17**
DK4N ON FLT	DK4N ON FLT	DK4N OFF FLT	DK4N OFF FLT	DK4N BOTH-PMP	DK4N BOTH-PMP	DK4N ALM FLT	DK4N ALM FLT

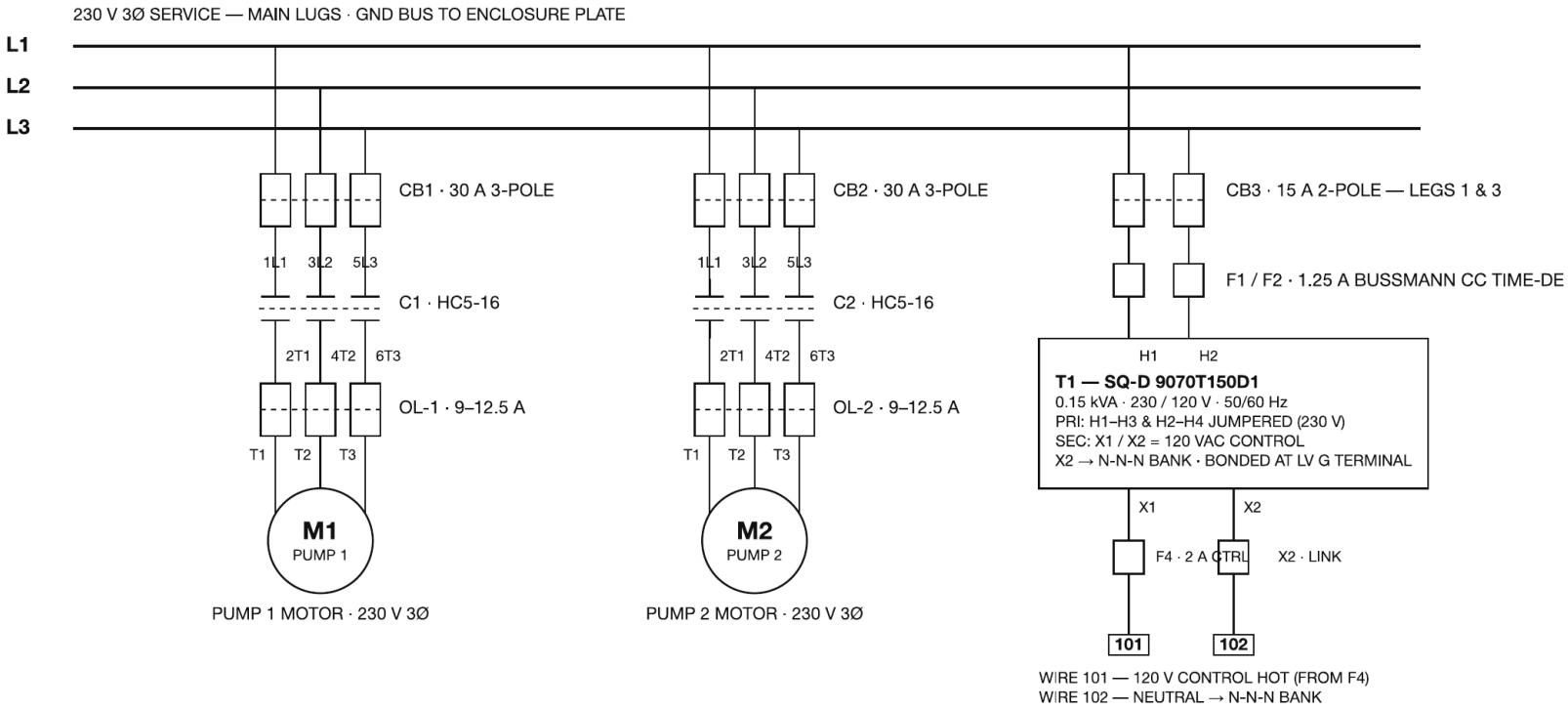
NEUTRAL BANK + LV GND				CONTROL FUSES		RELAYS		ALTERNATOR
N	**N**	**N**	**G**	**F3**	**F4**	**R1**	**R2**	**R3**
DK4N NEUTRAL	DK4N NEUTRAL	DK4N NEUTRAL	DK4N-PE LV GND	DINKLE FUSE TERM 2 A — ALARM	DINKLE FUSE TERM 2 A — CONTROLS	DINKLE SPDT CUBE RELAY FLOAT RELAY	DINKLE DPDT CUBE RELAY BOTH-PUMP	TELE E1ZMLA10 ALTERNATING RELAY DIAL = LA

N-N-N are jumpered as one bank and land the 120 V grounded conductor (T1 X2) plus the return leg of every control coil, the alarm globe and the buzzer. The DK4N-PE at the end of that bank bonds it to the main PE rail and takes the bonding conductor off the T1 core / casing. F1 / F2 (1.25 A Bussmann CC time-delay primary fuse terminals) mount with the transformer feeder — see section B.

FLOAT SEQUENCE — BOTTOM TO TOP

1. OFF float → terminals **12 & 13** (13 = F4 hot). Lowest float. Makes on rise and arms the pump call and both-pump legs; on fall it is what shuts the pumps off.
2. ON float → terminals **10 & 11** (11 jumpered from 12). Second up. Picks R1, R1 seals itself in through pins 3→4 and sends 120 V to R3 B1, which starts whichever pump the alternator has as lead.
3. BOTH-PUMP float → terminals **14 & 15** (15 jumpered from 16, alarm fuse F3). Third up. Picks R2; 11→14 and 21→24 feed both AUTO legs so pump 1 and pump 2 run together regardless of which one is lead.
4. ALARM float → terminals **16 & 17**. Highest. Lights AL1 and sounds BZ1 on the separately fused alarm branch. It calls no pump.

1 — POWER CIRCUIT · 230 VAC 3Ø 60 Hz



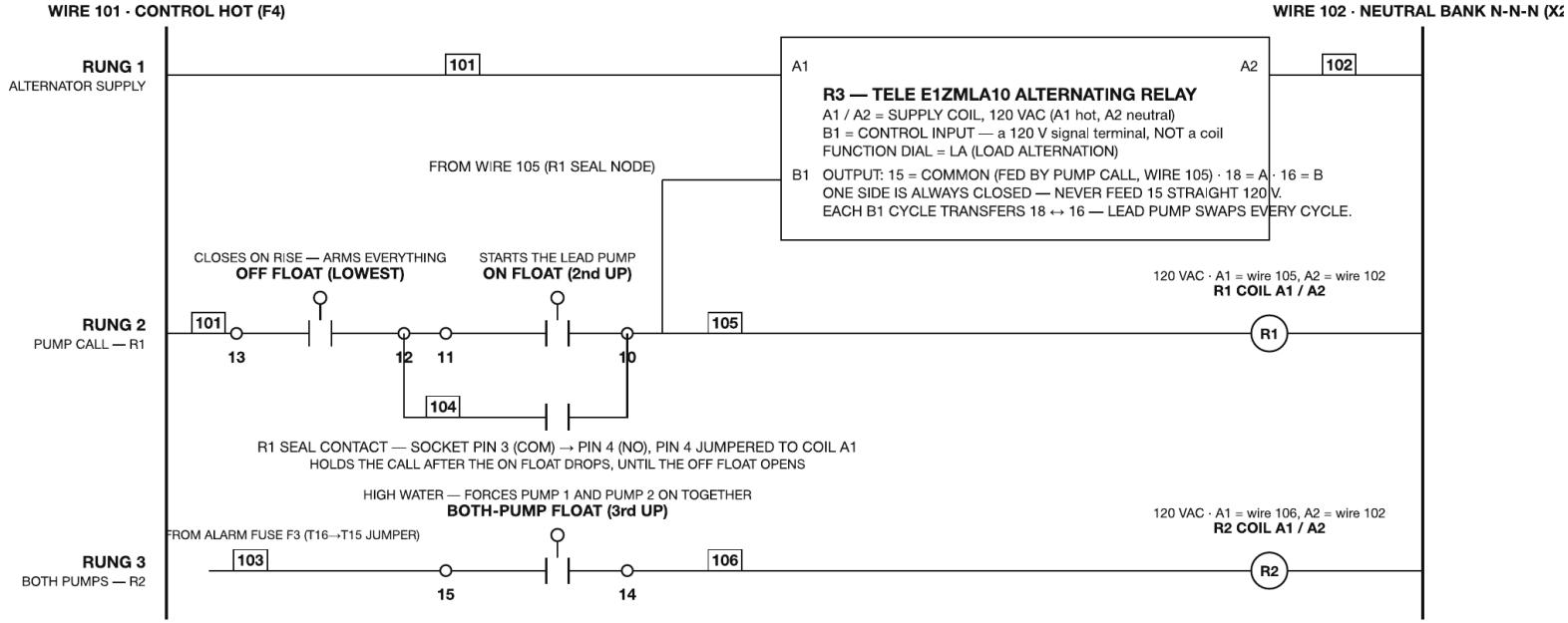
CB1 / CB2 — 30 A 3-pole pump branch breakers · **C1 / C2** — HITIO HC5-16 contactors · **OL1 / OL2** — 9–12.5 A thermal overloads · **M1 / M2** — pump motors 3 HP / 10 A, 230 V 3Ø, leads on terminals 4-5-6 / 7-8-9.

CB3 — 2-pole control feeder off terminals 1 & 3 · **F1 / F2** — 1.25 A Bussmann CC time-delay · **T1** — 230/120 V control transformer · **F3 / F4** — 2 A alarm / control fuses · X2 → N-N-N bank, bonded at LV G terminal.

LC-9100 DUPLEX PUMP PANEL — SCHEMATIC SET · CONTROL LADDER — RUNGS 1-3

LEFT RAIL = WIRE 101 CONTROL HOT (F4) · RIGHT RAIL = WIRE 102 NEUTRAL N-N-N · ON FLOAT = 10/11 · OFF FLOAT = 12/13

C — 120 VAC CONTROL LADDER · ALL COIL AND CONTACT TERMINALS SHOWN



CONTROL WIRE SCHEDULE — EVERY LANDING

101 Control hot (F4 load) — R3 A1 · R2 11 · R2 21 · SS1 scr 1 · SS2 scr 1 · C1 aux 13 · C2 aux 13 · **terminal 13**

102 Neutral bank N-N-N (T1 X2) — R1 A2 · R2 A2 · R3 A2 · C1 A2 · C2 A2 · PL1 neutral · PL2 neutral · AL1 neutral · BZ1 neutral

103 Alarm hot (F3 load) — **terminal 16 → terminal 15** (jumper, feeds both-pump float) · PB1 scr 1

104 Off-float-made bus — **terminal 12 → terminal 11** (jumper) · R1 pin 3

105 Pump call / R1 seal — **terminal 10** · R1 coil A1 · R1 pin 4 · R3 B1 · **R3 15**

106 Both-pump call — **terminal 14** · R2 coil A1

107 Pump 1 auto feed — R3 18 · SS1 scr 3

108 Pump 2 auto feed — R3 16 · SS2 scr 3

109 Pump 1 override — R2 14 · SS1 scr 3 (lands with wire 107)

110 Pump 1 coil feed — SS1 scr 2 · SS1 scr 4 · OL1 95

111 Pump 1 coil — OL1 96 · C1 A1

112 Pump 2 override — R2 24 · SS2 scr 3 (lands with wire 108)

113 Pump 2 coil feed — SS2 scr 2 · SS2 scr 4 · OL2 95

114 Pump 2 coil — OL2 96 · C2 A1

115 Alarm node — **terminal 17** · PB1 scr 2 · AL1 line · SS3 scr 1

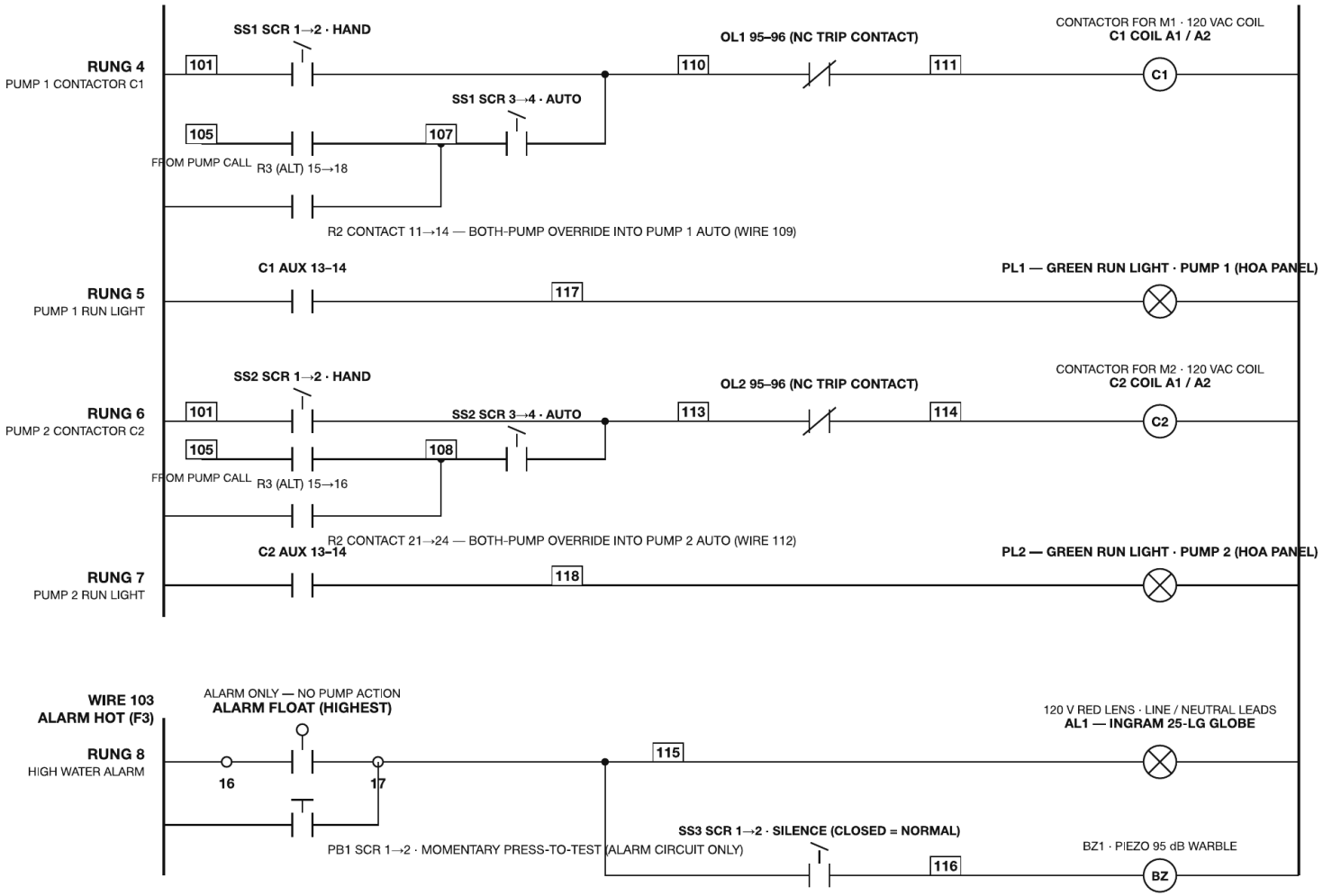
116 Buzzer feed — SS3 scr 2 · BZ1 line

117 Pump 1 run light — C1 aux 14 · PL1 line

118 Pump 2 run light — C2 aux 14 · PL2 line

LC-9100 DUPLEX PUMP PANEL — SCHEMATIC SET · CONTROL LADDER — RUNGS 4-8

LEFT RAIL = WIRE 101 CONTROL HOT; LOWER LEFT RAIL = WIRE 103 ALARM HOT (F3) · RIGHT RAIL = WIRE 102 NEUTRAL



DEVICE SCHEDULE — CONTROL CIRCUIT

CB3 — 2-pole breaker, control transformer feeder off terminals 1 & 3 (leg 1 / leg 3 of the utility service).
F1 / F2 — Dinkle fuse terminals on the T1 primary. 1.25 A Bussmann Class CC time-delay, one per leg.
T1 — control transformer, 230 V primary (H1/H2) / 120 V secondary (X1/X2). Casing bonded to the LV "G" terminal.
F3 — Dinkle fuse terminal, 2 A, alarm branch only (wire 103).
F4 — Dinkle fuse terminal, 2 A, control branch (wire 101).
R1 — float relay, Dinkle plug-in cube, **SPDT. Coil = A1 / A2, 120 VAC.** Seal contact = socket pins 3 (common) and 4 (NO); pin 4 jumpers to coil A1. Dry contact, not a coil terminal.
R2 — both-pump activating relay, Dinkle plug-in cube, **DPDT. Coil = A1 / A2, 120 VAC.** Pole 1 = 11 com / 12 NC / 14 NO; pole 2 = 21 com / 22 NC / 24 NO.
R3 — Tele E1ZMLA10 alternating relay. **A1 / A2 = 120 VAC supply coil. B1 = control input signal terminal** (it is fed 120 V, it is not a second coil). Output changeover contact 15 com / 18 A / 16 B — one side is ALWAYS closed, so 15 is fed from the pump call (wire 105), never from constant 120 V. Dial set to LA.
C1 / C2 — pump contactors for M1 / M2, 120 VAC coils on terminals A1 / A2. Aux contact 13–14 (NO) closes when the contactor pulls in.
PL1 / PL2 — green pilot lights on the HOA switch panel, 120 V. Lit through C1 / C2 aux 13–14 — ON = coil locked in, pump running.
OL1 / OL2 — thermal overloads on M1 / M2. Only the 95–96 NC trip contact is used in the control circuit; 97–98 NO is spare.
SS1 / SS2 — 3-position HAND-OFF-AUTO rotary selectors, HBDY5-KW-11X/31/201, Yueqing Dahe Electric. Screws 1–2 = HAND, screws 3–4 = AUTO.
SS3 — 2-position alarm silence rotary, HBDY5-KW-11X/201, same maker. Screws 1–2 closed in NORMAL.
PB1 — momentary push button, HBDY5-KW-10/W/201, Yueqing Dahe Electric. NO contact, screws 1–2.
AL1 — Ingram 25-LG alarm globe, 120 V.
BZ1 — piezo buzzer alarm, 95 dB, 120 VAC, 50 mA max, warble tone.

NOTES

1. Every float lands on its own pair of DK4N terminals — no piggybacking of float leads. The 12 → 11 jumper (wire 104) and 16 → 15 jumper (wire 103) are panel-side, not field leads.
2. Jumper SS1 scr 2 to scr 4 (and SS2 scr 2 to scr 4) so HAND and AUTO share one output to the overload.
3. Jumper R1 socket pin 4 back to coil terminal A1 to form the seal-in; the same node carries out to R3 B1 and R3 15.
4. Wires 107 and 109 both land on SS1 scr 3 (108 and 112 on SS2 scr 3) — use a twin ferrule or a bridged pair.
5. Set the E1ZMLA10 function dial to LA before energizing, or the outputs will not alternate.
6. F3 keeps the alarm alive if F4 opens. Never fuse the grounded conductor on the N bank.
7. SS3 silences BZ1 only — AL1 stays lit until the level drops off the alarm float.
8. PB1 feeds wire 115 only; it cannot start a pump in any selector position.