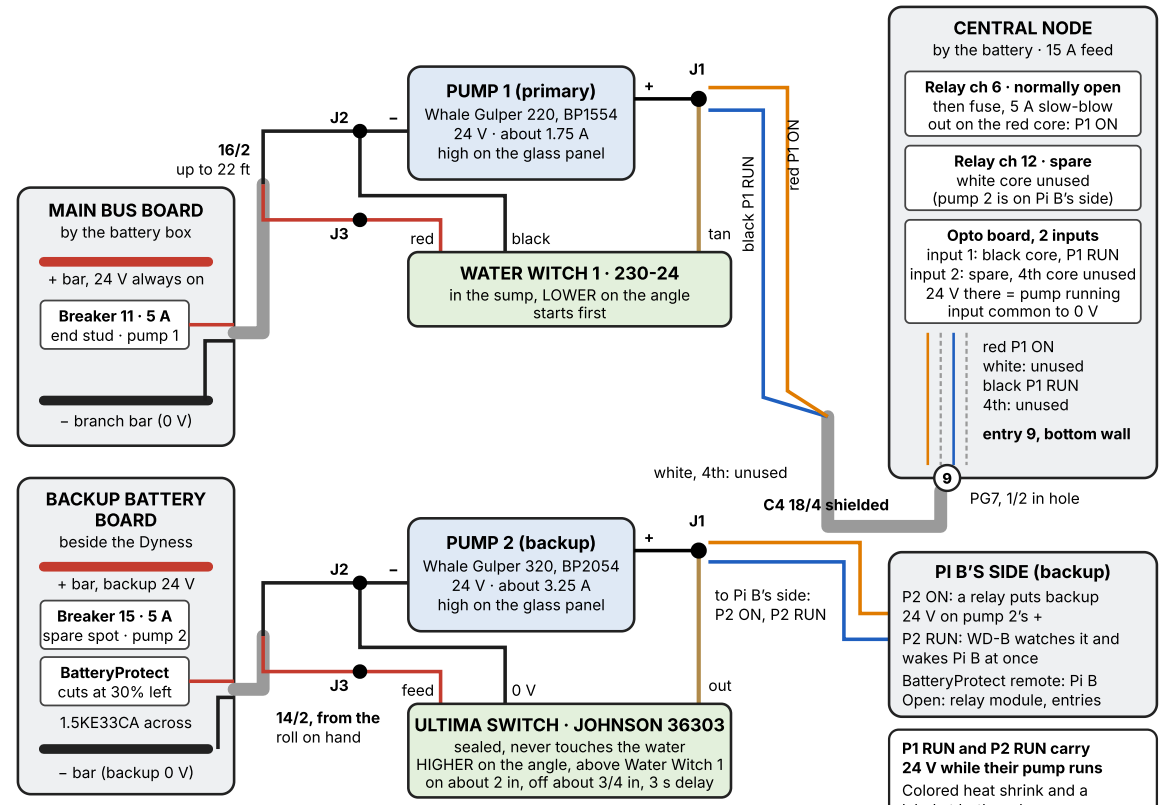
BILGE PUMP WIRING

Boat 1 · both pumps · a wiring map, not to scale, not placed as on the boat

Oct 31, 2026 · Updated 2026-11-01 · 1 page



HOW IT WORKS

- **Water runs the pump, no computer needed.** Pump 1: line 11's 5 A breaker, then Water Witch 1 (turns on when wet 6 to 8 s; runs 15 s more when dry). Pump 2: the backup battery, always: line 15's 5 A breaker, a BatteryProtect, then the Ultima switch, sealed so the bilge water cannot join the two sides.
- **Two steps by height.** The Ultima sits higher: pump 2 starts only if pump 1 falls behind.
- **Pump 2 cannot flatten the backup battery.** The BatteryProtect cuts it at about 30% left; its remote input goes to Pi B, so shore can stop a stuck pump 2.
- **Shore can run either pump.** Ch 6 puts 24 V on pump 1's +, after the Water Witch, no diode; pump 2's manual-on is on Pi B's side. A dead node leaves ch 6 open.
- **Run signals.** Pump 1's + to opto input 1. WD-B watches pump 2's running line and wakes Pi B at once; Pi B runs pump 2's monthly 5-second exercise.
- **Power-up:** Water Witch 1 runs pump 1 a few seconds to set itself. Not a leak.

THE RUNS

RUN	WIRE
Water Witch 1	From the maker: three 16 AWG, 30 in. Red to J3, black to J2, tan to J1. Rated 15 A at 24 V
Ultima	Johnson 36303, 10 A at 24 V. Feed to J3, 0 V to J2, pump lead to J1 (colors per Johnson's sheet)
Pump feed	Pump 1: 16/2, good to 22 ft. Pump 2: 14/2 (roll on hand). Red to J3, black to J2
Bilge cable	C4 18/4 shielded, one piece from node entry 9. Red: P1 ON, after ch 6's 5 A fuse. Black: P1 RUN, opto input 1. White, 4th: unused, sleeved (ch 12, opto input 2 spare). Shield sleeved both ends
At the pumps	Each pump's ON and RUN wires join its + at J1, after its switch, no diode (pump 2's from Pi B's side)

RULES

- Every joint above the highest bilge water, sealed. Crimped, never soldered.
- Service loops so a pump comes out without cutting anything.
- Dead first (no breaker has an off lever): pump 1, main battery switch off; pump 2, lift one end of the backup board's 30 A ANL.
- P1 RUN and P2 RUN carry 24 V while their pump runs: colored heat shrink and labels at both ends, never on a 0 V terminal.
- Label both ends: P1+, P1–, P1 ON, P1 RUN; same for P2.

STILL OPEN

- The part for J1 and J2 (three wires each) is not set.
- Where pump 2's two signal wires enter on Pi B's side, and which relay module switches its manual-on. The BatteryProtect's exact cut voltage.

Homes: Build Guide sec 3.6; Electronics and Wiring Plan secs 4.1, 7.6, A3 (entry 9) and A10; Compute Bay Plan sec 11; Backup Battery Board Layout; Water Witch 217/230/230-24 install sheet.