



You Can Do it

PROJECT

Install an ELCI Breaker

Safeguard swimmers near your
boat against electrocution from
stray AC current

Equipment Leakage Circuit Interrupter (ELCI)



New ABYC recommendation for
ELCI circuit protection inside

SHORE
POWER

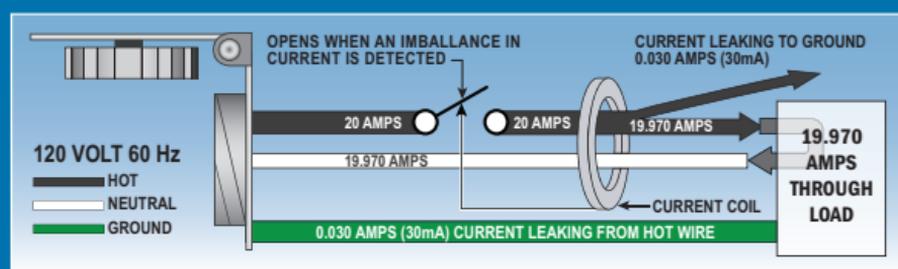
There are two potential failures in a boat's electrical system that can put people on or around the boat at risk of lethal electric shock.

#1 FAILURE: GROUND FAULT



Occurs when current leaks from the hot or neutral wire to the ground wire commonly caused by insulation failure of the wire. An ELCI Circuit Breaker detects the current imbalance and opens (trips), stopping the dangerous flow of current.

Example: An insulation failure in the wiring of an appliance.

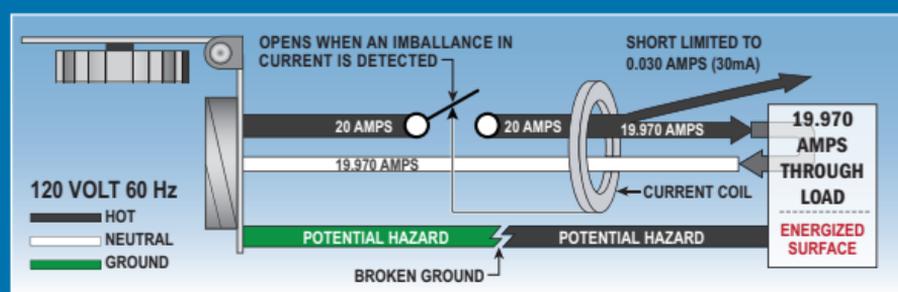


#2 FAILURE: FAULTY GROUND



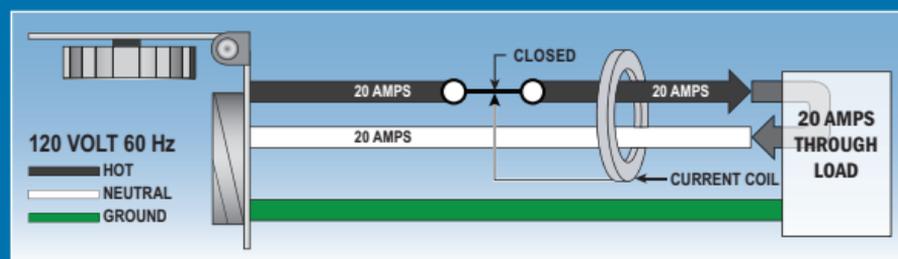
Occurs when the grounding path is broken as a result of a loose connection or a broken wire. An ELCI Circuit Breaker detects the current imbalance and opens (trips), stopping the dangerous flow of current.

Example: A shore power cord ground wire failure due to constant motion and stress.



PROPERLY FUNCTIONING ELECTRICAL SYSTEM

In a properly functioning electrical system, the same amount of AC current flows in the hot and neutral wires.



The combination of a ground fault and a faulty ground can result in metal parts on the boat and under water becoming energized. When these two conditions occur at the same time, the results may be tragic. If an electric appliance with faulty internal wiring or a worn cord falls into the bilge, the water in the bilge will become energized, putting the worker and those nearby at risk.

In addition to the hazard to people on the vessel, there is a larger danger to swimmers near the boat. While people on board are likely to receive a shock from touching energized metal parts, nearby swimmers could receive a paralyzing dose of electricity and drown due to involuntary loss of muscle control.

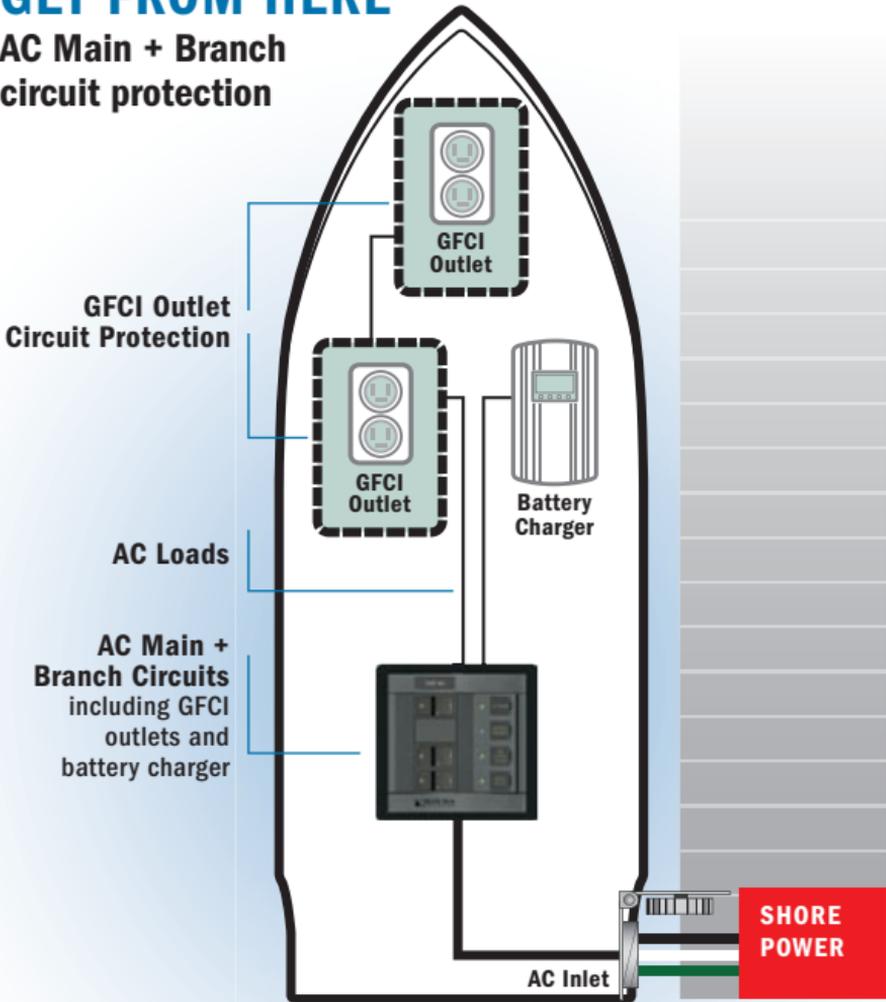
A Coast Guard sponsored study showed numerous instances of electrical leakage causing drowning or potential drowning even though the shock did not directly cause electrocution.

Given the seriousness of the problem, the American Boat and Yacht Council (ABYC) requirements now include specific measures for avoiding this danger.

See ABYC E-13.3.5 and ABYC E-11.11.1

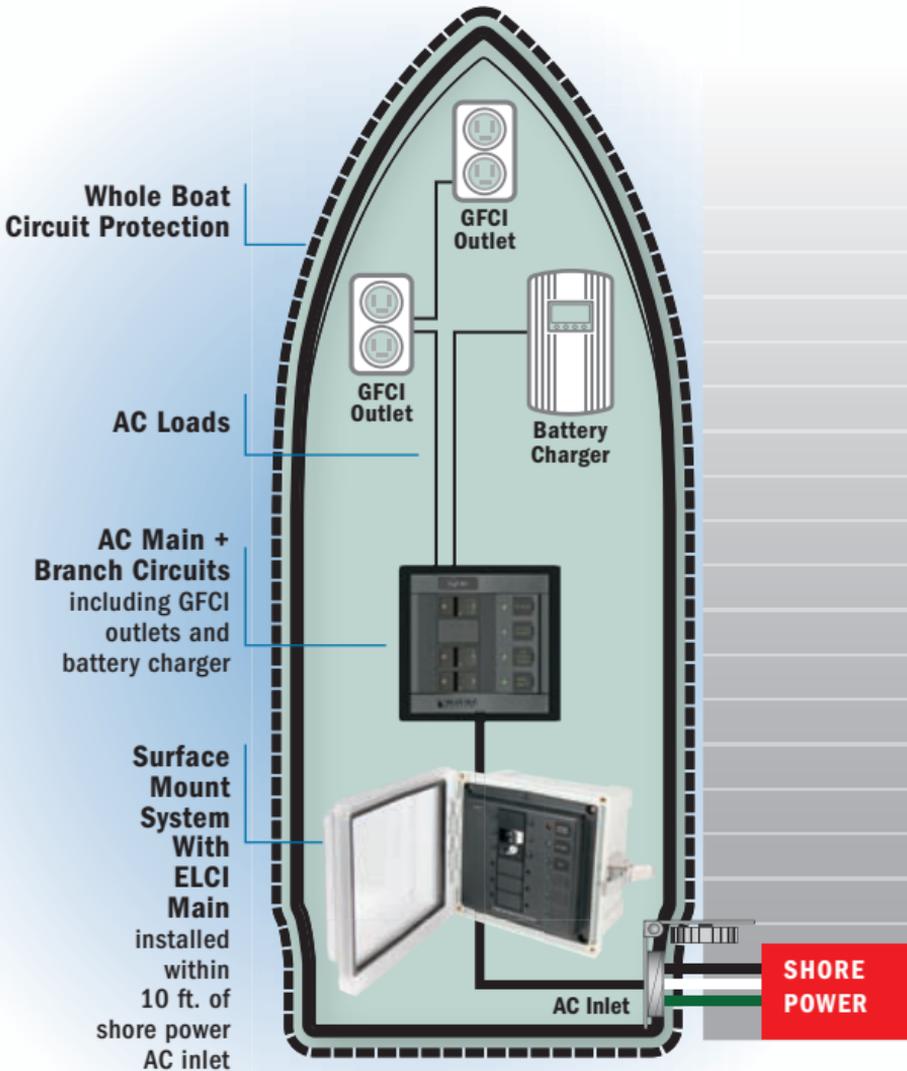
GET FROM HERE

AC Main + Branch circuit protection



TO HERE

Branch circuits with ELCI Main circuit protection provide overcurrent and leakage protection per ABYC E-11 for whole boat shore power protection



WHAT DOES THE ELCI AND GFCI DO?

Equipment Leakage Circuit Interrupters (ELCIs) are Residual Current Circuit Breakers (RCCBOs) which combine protection from current leakage detection with the overcurrent protection provided by an AC Main circuit breaker. ELCIs and Ground Fault Circuit Interrupters (GFCIs) measure current flow in the hot and neutral wires and immediately switch the electricity off if an imbalance of current flow is detected.

ELCIs provide whole-boat protection at the 30mA threshold. Installed as required within 10 feet of the shore power inlet, an ELCI provides protection against ground faults and faulty grounds for the AC shore power system on the boat. ELCIs provide protection against faults in wiring and wired appliances where GFCIs are not required. See the blue pages of this guide for more detail.

GFCIs are used as branch circuit ground fault protection at the 5mA threshold in potentially wet environments. They protect against electrocution from devices plugged into a GFCI-protected outlet.

Both ELCIs and GFCIs are required by ABYC. They are an important part of a boat's safety system, providing protection for those in and around the boat.

ABYC RECOMMENDATIONS

Ground Fault Circuit Interrupters (GFCIs)

ABYC E-13.3.5 states:

If installed in a head, galley, machinery space, or on a weather deck, the receptacle shall be protected by a Type A (nominal 5 milliamperes) Ground Fault Circuit Interrupter (GFCI).

Equipment Leakage Circuit Interrupters (ELCIs)

ABYC E-11.11.1 states:

An Equipment Leakage Circuit Interrupter (ELCI) shall be installed with or in addition to the main shore power disconnect circuit breaker(s) or at the additional overcurrent protection as required by E-11.10.2.8.3 whichever is closer to the shore power connection.

GFCI BRANCH AND ELCI MAIN CIRCUIT BREAKER MOUNTING OPTIONS

Update existing Traditional Metal toggle
circuit breaker panel to comply with ABYC E-11



ELCI Main Toggle ●
*Requires 3 circuit positions
(2) AC Main, (1) Test Button*

Update existing 360 Panel System to
comply with ABYC E-11



GFCI Branch Rocker
*Requires 2 circuit positions
(1) AC Branch, (1) Test Button*



ELCI Main Rocker ●
*Requires 3 circuit positions
(2) AC Main, (1) Test Button*

Mounts on a bulkhead in a lazarette,
engine room, or equipment space



Surface Mount System

Per ABYC, the ELCI panel cannot be mounted further
than the reach of a 10 ft. cable from the AC power inlet



360 Panel System



Traditional Metal Panel

LEGEND

● Ignition protection

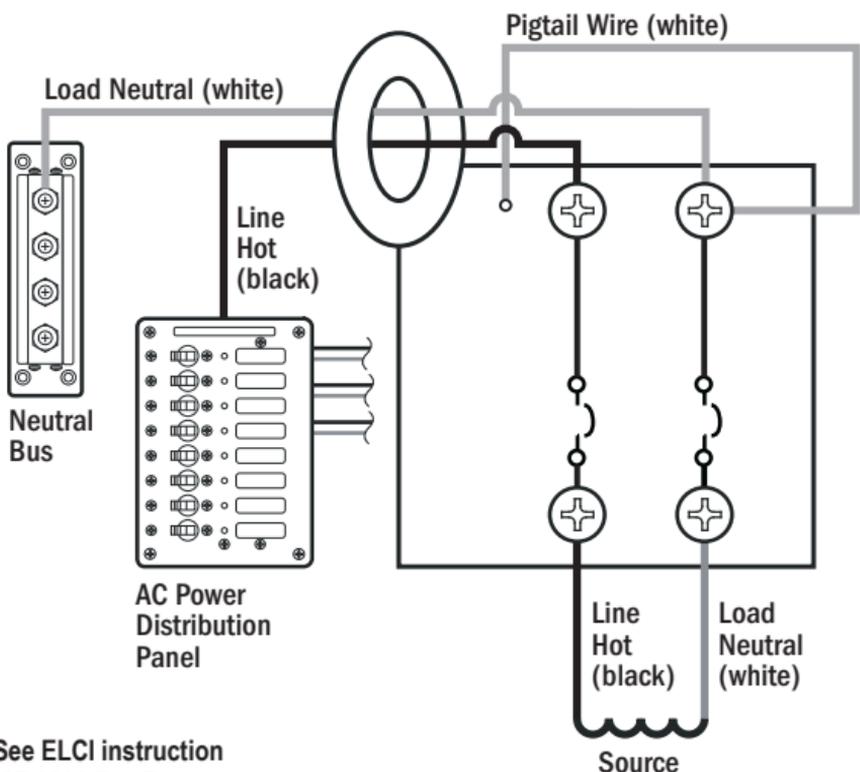
ELCI INSTALLATION REVIEW

SAFETY INSTRUCTIONS:

1. Do not ground neutral wire on the load side of the ELCI.
2. Test once a month.
3. Do not reverse line and load connections.

INSTALLATION PROCEDURE:

1. Unplug shore power or turn off and lock out the power to the enclosure in which the ELCI is to be installed.
2. Turn off the ELCI handle. Feed the load side (L1) hot and (N) neutral wires through the opening in the sensing coil. Connect to the appropriate load side terminals of the circuit breaker. Connect corresponding line side (source) wires directly to the Breaker Line Terminals.
3. Connect the white pigtail neutral wire of the ELCI to the panel load neutral bus bar or the load side neutral terminal (see below).
4. Mount ELCI to front panel and mount front panel to enclosure (may be mounted first, depending on installation).
5. Turn on power and turn on breaker handle.
6. Press test button to confirm trip and reset breaker.
7. Place Monthly Test Reminder label in a convenient place near (or on) the panel.



See ELCI instruction
IST-0006 Rev.B

For information about GFCI installation, please refer to www.blueseas.com



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