AC ~ DC ⎓

A-Series Toggle Circuit Breakers

Combines switching and circuit protection into a single device

7202 7200 7233

Features

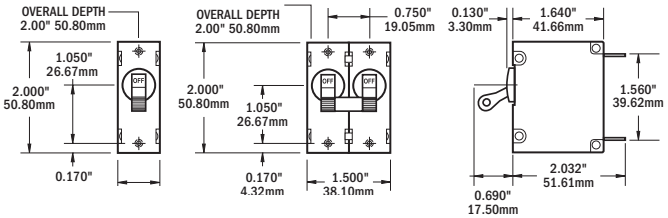
- The industry standard circuit breaker for Blue Sea Systems electrical panels
- Single pole is frequently used for AC or DC Branch circuit protection
- Double pole is typically used for AC Main circuit protection
- Trip Free– cannot be held closed after trip

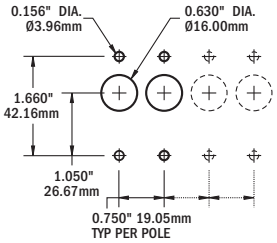
Specifications

Iic	Interrupting Capacity	See Interrupting Capacity Table
Vmxo	Voltage Max. Operating	65V DC / 250V AC
Itr	Amperage Trip Reference	See table
Tmno	Temperature Min. Operating	-40°C
Tmxo	Temperature Max. Operating	85°C
Cs	Switching Cycles	10,000 @ rated amps and volts
Type		Magnetic Hydraulic–Trip free
Terminal Screw		#10-32 Stainless Steel
Terminal Screw Torque		14–15 in-lb Recommended
Trip Time Delay		See www.bluesea.com
Mounting Screw		#6-32 Stainless Steel (included)
Mounting Screw Torque		6–8 in-lb Recommended

Regulatory

CE marked, TUV certified, CSA certified, UL 1077 recognized





Cut out Dimensions

Part N°	Color	Poles	Itr DC Amps	Itr AC Amps
7200	Black	1	5A DC	5A AC
7201	Red	1	5A DC	5A AC
7202	White	1	5A DC	5A AC
7347	Black	1	8A DC	8A AC
7299	White	1	8A DC	8A AC
7204	Black	1	10A DC	10A AC
7205	Red	1	10A DC	10A AC
7206	White	1	10A DC	10A AC
7208	Black	1	15A DC	15A AC
7209	Red	1	15A DC	15A AC
7210	White	1	15A DC	15A AC
7212	Black	1	20A DC	20A AC
7213	Red	1	20A DC	20A AC
7214	White	1	20A DC	20A AC
7216	Black	1	25A DC	25A AC
7217	Red	1	25A DC	25A AC
7218	White	1	25A DC	25A AC
7220	Black	1	30A DC	30A AC
7221	Red	1	30A DC	30A AC
7222	White	1	30A DC	30A AC
7224	Black	1	40A DC	40A AC
7225	Red	1	40A DC	40A AC
7226	White	1	40A DC	40A AC
7228	Black	1	50A DC	50A AC
7229	Red	1	50A DC	50A AC
7230	White	1	50A DC	50A AC

Part N°	Color	Poles	Itr DC Amps	Itr AC Amps
7232	Black	2	10A DC	10A AC
7233	White	2	10A DC	10A AC
7234	Black	2	15A DC	15A AC
7235	White	2	15A DC	15A AC
7348	Black	2	16A DC	16A AC
7294	White	2	16A DC	16A AC
7236	Black	2	20A DC	20A AC
7260	White	2	20A DC	20A AC
7237	Black	2	30A DC	30A AC
7238	White	2	30A DC	30A AC
7349	Black	2	32A DC	32A AC
7295	White	2	32A DC	32A AC
7239	Black	2	40A DC	40A AC
7240	White	2	40A DC	40A AC
7241	Black	2	50A DC	50A AC
7242	White	2	50A DC	50A AC

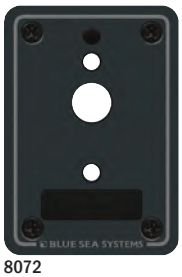
Interrupting Capacity Table (see ABYC Requirements page 126)

			UL 1077 - UL/CSA (US/Canada)	EN60934 - TUV (Europe)
Poles	Vmxo Volts	Itr Amps	Iic Interrupt	Iic Interrupt
1 Pole	65V DC	5–50A	7,500A	-
	120V AC	5–50A	3,000A	-
	250V AC	5–50A	3,000A	1,500A
2 Pole	65V DC	10–50A	7,500A	-
	120V AC	10–50A	3,000A	-
	120/240V AC	10–50A	3,000A	-
	250V AC	10–50A	3,000A	1,500A

Circuit Breaker Mounting Options

- 3131 enclosure, strain reliefs included for secure installation of circuit breakers
- 3131 enclosure, accepts A-Series Toggle and A and C-Series Flat Rocker Circuit Breakers, LEDs (p. 116), and Square Format Labels (p. 117) for custom configurations
- 8072 and 8173 panels, accept A-Series Toggle Circuit Breakers, Large Format Labels (p. 117) and LEDs (p. 116)

3131



8072

8173

Part N°	Description	Width in (mm)	Height in (mm)	Depth in (mm)
3131	Circuit Breaker Enclosure	3.95 (100.36)	4.92 (124.91)	4.07 (103.40)
8072	Single pole mounting panel	2.63 (66.80)	3.75 (92.25)	0.125 (3.175)
8173	Double pole mounting panel	2.63 (66.80)	3.75 (92.25)	0.125 (3.175)

Related Products

360 Panel System p. 80

Traditional Metal Panel p. 81

Specifications subject to change. See bluesea.com for current information.

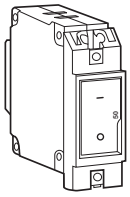
AC ~ DC ⎓

A-Series Rocker Circuit Breakers

Combines switching and circuit protection into a single device

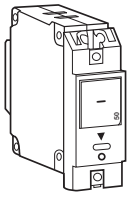
7403
Flat Rocker

- Standard circuit breaker used on the 360 Panel System (1200 Series)
- Flat actuator resists accidental switching by being flush in the ON position



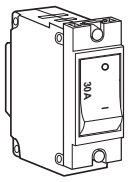
7425
Restricted OFF Rocker

- Actuator shows white in the OFF position
- Restricted OFF actuator can only be switched to OFF by insertion of small screwdriver into slot



7574
Raised Rocker

- Standard circuit breaker for AC Source Select panels in the 360 Panel System



Features

- White actuator indicates OFF position
- Single pole is available in Flat Rocker and Restricted Off styles
- Single pole is frequently used for AC or DC Branch circuit protection
- Double pole is available in Flat Rocker and Raised Rocker styles
- Double pole is typically used for AC Main circuit protection
- Raised Rocker actuator style is used for AC source selection on the 360 Panel System
- International ON and OFF symbols support vertical or horizontal mounting

Specifications

Iic	Interrupting Capacity	See Interrupting Capacity table below
Vmxo	Voltage Max. Operating	32V DC / 250V AC
Itr	Amperage Trip Reference	See table
Tmno	Temperature Min. Operating	-40°C
Tmxo	Temperature Max. Operating	85°C
Cs	Switching Cycles	10,000 @ rated amps and volts
Type		Magnetic Hydraulic—Trip free
Terminal Screw		#10-32 Stainless Steel
Terminal Screw Torque		14–15 in-lb Recommended (load terminal is 30° angled)
Trip Time Delay		See www.bluesea.com
Mounting Screw		#6-32 Stainless Steel (included)
Mounting Screw Torque		6–8 in-lb Recommended

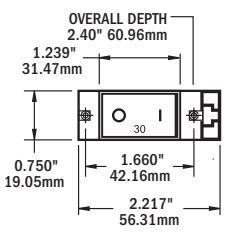
Regulatory

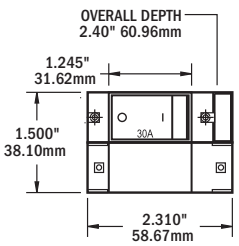
CE marked, TUV certified, CSA certified, UL 1077 recognized

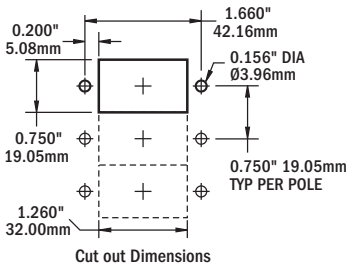
Interrupting Capacity Table (see ABYC Requirements page 126)

			UL 1077 - UL/CSA (US/Canada)	EN60934 - TUV (Europe)
Poles	Vmxo Volts	Itr Amps	Iic Interrupt	Iic Interrupt
1 Pole	32V DC	5–50A	5,000A	-
	125V AC	5–50A	3,000A	-
	250V AC	5–50A	1,500A	1,500A
2 Pole	32V DC	10–50A	5,000A	-
	240V AC	10–50A	3,000A	-
	240V AC	10–50A	3,000A	1,500A

Part N°	Actuator Styles	Poles	Itr DC Amps	Itr AC Amps
7400	Flat Rocker	1	5A DC	5A AC
7425	Restricted Off	1	5A DC	5A AC
7401	Flat Rocker	1	8A DC	8A AC
7402	Flat Rocker	1	10A DC	10A AC
7427	Restricted Off	1	10A DC	10A AC
7403	Flat Rocker	1	15A DC	15A AC
7428	Restricted Off	1	15A DC	15A AC
7404	Flat Rocker	1	20A DC	20A AC
7429	Restricted Off	1	20A DC	20A AC
7405	Flat Rocker	1	25A DC	25A AC
7430	Restricted Off	1	25A DC	25A AC
7406	Flat Rocker	1	30A DC	30A AC
7407	Flat Rocker	1	40A DC	40A AC
7408	Flat Rocker	1	50A DC	50A AC
7433	Restricted Off	1	50A DC	50A AC
7410	Flat Rocker	2	10A DC	10A AC
7411	Flat Rocker	2	15A DC	15A AC
7412	Flat Rocker	2	16A DC	16A AC
7413	Flat Rocker	2	20A DC	20A AC
7574	Raised Rocker	2	30A DC	30A AC
7414	Flat Rocker	2	30A DC	30A AC
7575	Raised Rocker	2	32A DC	32A AC
7415	Flat Rocker	2	32A DC	32A AC
7416	Flat Rocker	2	40A DC	40A AC
7577	Raised Rocker	2	50A DC	50A AC
7417	Flat Rocker	2	50A DC	50A AC







Cut out Dimensions

AC ~ DC ⎓

C-Series Toggle Circuit Breakers

Combines switching and circuit protection into a single device

7250*

AC ~ DC ⎓

7267

7270

DC ⎓

7251

7287

AC ~

DC Features

- Large frame provides stud termination for 5–300 Amp loads
- Provides overcurrent protection for inverters, bow thrusters, and windlasses
- Offers high interrupt capacity—suitable for Main circuit protection
- Trip Free— cannot be held closed after trip

AC Features

- Frequently used for 120/240 Volt AC circuit protection
- Double pole can be used as AC Main circuit breaker to switch hot and neutral or two hots in 120/240 Volt AC Branch applications
- Triple pole can be used as 120/240 Volt AC Main circuit breaker to switch both lines (hots) and neutral
- Double and triple pole circuit breakers will trip all poles if any one pole trips

DC and AC Specifications

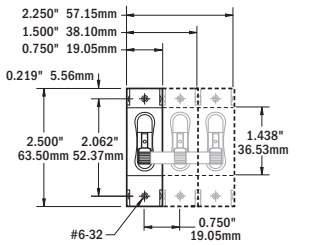
Iic	Interrupting Capacity	See Interrupt Capacity Table
Vmxo	Voltage Max. Operating	See Interrupt Capacity Table
Itr	Amperage Trip Reference	See table
Tmno	Temperature Min. Operating	-40°C
Tmxo	Temperature Max. Operating	85°C
Cs	Switching Cycles	10,000 @ rated amperage and voltage
Type		Magnetic Hydraulic–Trip free
Terminal Stud		1/4"-20 Tin-Plated Brass
Terminal Stud Torque		35 in-lb max.
Trip Time Delay		See www.bluesea.com
Mounting Screw		#6-32 Stainless Steel (included)
Mounting Screw Torque		6–8 in-lb Recommended

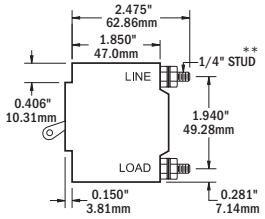
Regulatory

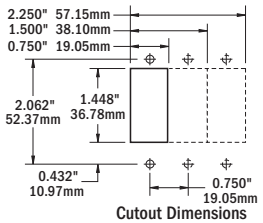
7250I Only—meets SAE J1171, UL 1500, and ISO 8846 external ignition protection requirements

Part N°	Color	Poles†	Itr DC Amps	Itr AC Amps
7350	White	1	5A DC	5A AC
7351	White	1	10A DC	10A AC
7352	White	1	15A DC	15A AC
7353	White	1	20A DC	20A AC
7354	White	1	25A DC	25A AC
7355	White	1	30A DC	30A AC
7244	White	1	50A DC	50A AC
7246	White	1	60A DC	60A AC
7248	White	1	80A DC	80A AC
7250	White	1	100A DC	100A AC
7250I	Red	1	100A DC	100A AC
7365	White	2	-	30A AC
7251	White	2	-	50A AC
7254	White	2	-	60A AC
7256	White	2	-	80A AC
7258	White	2	-	100A AC
7267	White	2*	150A DC	-
7268	White	2*	175A DC	-
7269	White	2*	200A DC	-
7287	White	3	-	50A AC
7288	White	3	-	60A AC
7289	White	3	-	80A AC
7290	White	3	-	100A AC
7270	White	3*	250A DC	-
7271	White	3*	300A DC	-

* Paralleled poles have 5/16" stud on bus







Cutout Dimensions

Interrupting Capacity Table (see ABYC Requirements page 126)

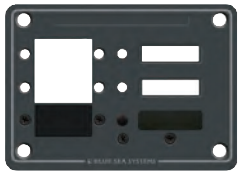
			UL 1077 - UL/CSA (US/Canada)	EN60934 - TUV (Europe)
Poles*	Vmxo Volts	Itr Amps	Iic Interrupt	Iic Interrupt
1 Pole*	80V DC	5–100A	10,000A	-
	125V AC	5–100A	5,000A	-
	250V AC	5–100A	5,000A	5,000A
1 Pole* PN 7250I	48V DC	100A	5,000A	-
	125V AC	100A	1,500A	-
2 and 3 Pole	65V DC	150–300A	5,000A‡	-
	125/250V AC	30–100A	5,000A	5,000A
	250V AC	30–100A	5,000A	5,000A

‡ No agency approvals

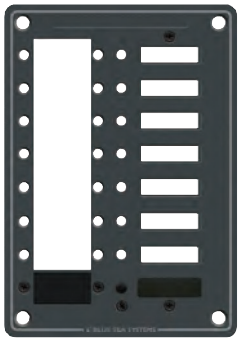
C-Series Toggle Circuit Breaker Mounting Panels

Simplifies mounting C-Series Toggle Circuit Breakers

- Accepts Blue Sea Systems Large Format Labels and ON indicating LEDs
- Panel plugs can be inserted to fill blank positions
- Panel Plug Kit 8089 included—circuit breaker mounting screws, panel plug, LED plug and blank label



8088



8087

Part N°	Description	Width in (mm)	Depth in (mm)
8088	3 position mounting panel	5.25 (133.35)	3.75 (95.25)
8087	8 position mounting panel	5.25 (133.35)	7.50 (190.50)
8089	Panel Plug Kit	-	-

AC~ DC⎓

C-Series Rocker Circuit Breakers

Combines switching and circuit protection into a single device

7540

AC~ DC⎓

7475

7554

DC⎓

7580

7568

AC~

DC Features

- White actuator indicates OFF position
- Large frame provides stud termination for 5–300 Amp loads
- Flat rocker actuator is flush in the ON position, reducing the risk of accidental switching
- Provides overcurrent protection for inverters, bow thrusters, and windlasses
- Trip Free—cannot be held closed after trip

Specifications

Iic	Interrupting Capacity	See Interrupt Capacity Table
Vmxo	Voltage Max. Operating	See Interrupt Capacity Table
Itr	Amperage Trip Reference	See table
Tmno	Temperature Min. Operating	-40°C
Tmxo	Temperature Max. Operating	85°C
Cs	Switching Cycles	10,000 @ rated amperage and voltage
Type	Magnetic Hydraulic—Trip free	
Terminal Stud		1/4"-20 Tin-Plated Brass
Terminal Stud Torque		35 in-lb max.
Trip Time Delay		See www.bluesea.com
Mounting Screw		#6-32 Stainless Steel (included)
Mounting Screw Torque		6–8 in-lb Recommended

Regulatory

Single-pole circuit breakers only– CE marked, meet SAE J1171, UL 1500 and ISO 8846 external ignition protection requirements, CSA certified, and UL 1077 recognized
AC Circuit breakers only–TUV certified, CSA certified, and UL 1077 recognized
AC and AC/DC Circuit breakers only– CE marked

Interrupting Capacity Table (see ABYC Requirements page 126)

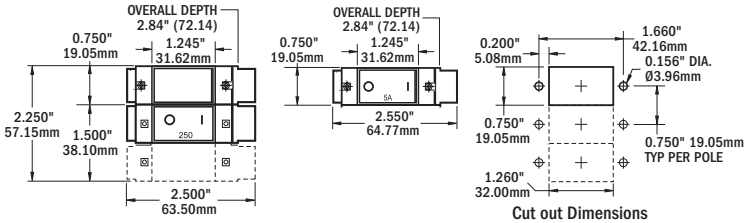
			UL 1077 - UL/CSA (US/Canada)	EN60934 - TUV (Europe)
Poles	Vmxo Volts	Itr Amps	Iic Interrupt	Iic Interrupt
1 Pole	32V DC	5–100A	5,000A	-
	120V AC	5–100A	3,000A	-
	240V AC	5–50A	3,500A	-
2 and 3 Pole	48V DC	150–300A	5,000A	-
	48V DC	150–200A	-	5,000A
	120/240V AC	30–100A	5,000A	-
	240V AC	30–100A	-	5,000A

AC Features

- Used for 120/240 Volt AC circuit protection
- Double pole can be used as AC Main circuit breaker to switch hot and neutral or two hots in 120/240 Volt AC Branch applications
- Triple pole can be used as 120/240 Volt AC Main circuit breaker to switch both lines (hots) and neutral
- Double and triple pole circuit breakers will trip all poles if any one pole trips

Part N°	Rocker Actuator	Poles	Itr DC Amps	Itr AC Amps
7540	Flat	1	5A DC	5A AC
7541	Flat	1	10A DC	10A AC
7542	Flat	1	15A DC	15A AC
7543	Flat	1	20A DC	20A AC
7545	Flat	1	30A DC	30A AC
7546	Flat	1	50A DC	50A AC
7547	Flat	1	60A DC	60A AC
7548	Flat	1	80A DC	80A AC
7549	Flat	1	100A DC	100A AC
7560	Flat	2	-	30A AC
7580	Raised	2	-	30A AC
7561	Flat	2	-	50A AC
7581	Raised	2	-	50A AC
7582	Raised	2	-	60A AC
7563	Flat	2	-	80A AC
7583	Raised	2	-	80A AC
7564	Flat	2	-	100A AC
7584	Raised	2	-	100A AC
7475	Flat	2*	150A DC	-
7476	Flat	2*	200A DC	-
7565	Flat	3	-	50A AC
7585	Raised	3	-	50A AC
7568	Flat	3	-	100A AC
7588	Raised	3	-	100A AC
7477	Flat	3*	250A DC	-
7554	Flat	3*	300A DC	-

* Paralleled poles have 5/16" stud on bus



Cut out Dimensions

Specifications subject to change. See bluesea.com for current information.

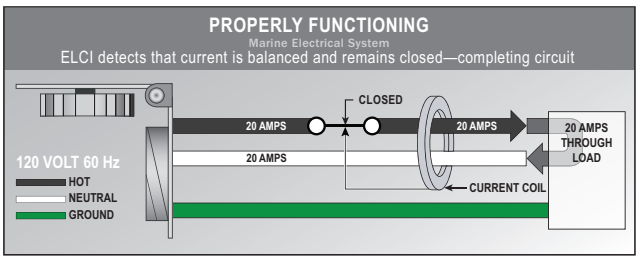
AC ~

Residual Current Circuit Breakers GFCI Branch and ELCI Main

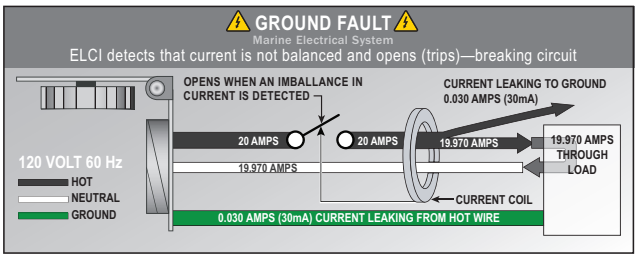
AC Ground Faults, the Boater, and ABYC Explained

Understanding Equipment Leakage Circuit Interrupters (ELCIs) and Ground Fault Circuit Interrupters (GFCIs) to make your boat safer.

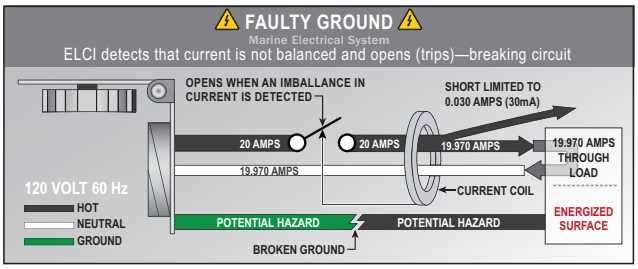
There are two potential failures in a boat's electrical system that can put people on or around the boat at risk of lethal electric shock.
In a properly functioning marine electrical system, the same amount of AC current flows in the hot and neutral wires.



However, if electricity "leaks" from this intended path in these two wires to ground, this condition is called a ground fault. A good example of this is an insulation failure in the wiring of an appliance.



In addition, a faulty ground can occur when the grounding path is broken through a loose connection or broken wire. For instance, a shore power cord ground wire may fail due to constant motion and stress.



Faulty grounds can be undetectable; a simple continuity test will not necessarily reveal a problem. When these two conditions occur at the same time, the results may be tragic. The combination of a ground fault and a faulty ground can result in metal parts on the boat and under water becoming energized. If an electric drill 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, ABYC requirements now include specific measures for avoiding this danger:

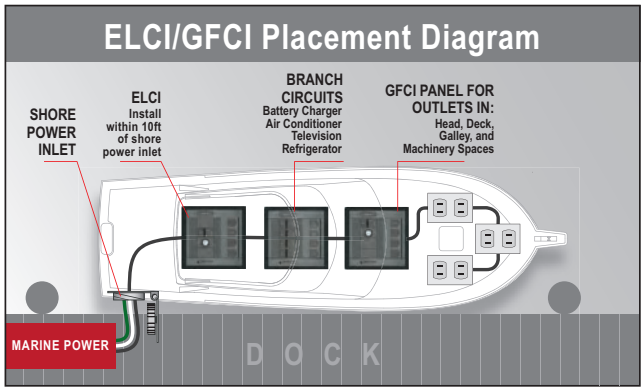
ABYC E–11.13.3.5 states:
If installed in a head, galley, machinery space, or on a weather deck, the receptacle shall be protected by a Type A (nominal 5 milliamperes) Ground Fault Circuit Interrupter (GFCI).

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.

ELCIs, and the more familiar GFCIs (Ground Fault Circuit Interrupter), are part of a larger family of devices that measure current flow in the hot and neutral wires and immediately switch the electricity off if an imbalance of current flow is detected. ELCIs and GFCIs that are also RCBOs (Residual Current Circuit Breaker) provide overcurrent tripping protection characteristic of a normal circuit breaker.

GFCIs are used as branch circuit ground fault protection at the 5mA threshold in potentially wet environments. GFCIs protect against flaws in devices plugged into them, but offer no protection from the danger of a failing hard-wired appliance, such as a water heater or cooktop.

In contrast, an ELCI provides additional whole-boat protection. Installed as required within 10' of the shore power inlet, an ELCI provides 30mA ground fault protection for the entire AC shore power system beyond the ELCI. ABYC regulations still require the use of GFCIs in environments described above.



Although ABYC regulations apply only to new boat construction, ELCIs can mitigate dangers and liabilities that exist for any boat owner with a shore power connection. Retrofitting an ELCI to an existing AC system can be a worthwhile safeguard against risk. Since an ELCI/RCBO can serve as the main shore power circuit breaker, it can replace a standard circuit breaker in this application. Alternatively, an ELCI/RCBO can be added between the shore power inlet and the existing main shore power circuit breaker.

Safety ground system failures on boats are safety and liability disasters waiting to happen. ELCI protection on each shore power line, combined with protection afforded by GFCIs, will reduce risk to those on the boat, the dock, and in the water surrounding the boat.

AC~

Residual Current Circuit Breakers

GFCI Branch and ELCI Main

Residual Current Devices (RCDs) respond to leakage of electrical current outside of the intended circuit path. When the RCD function is combined with a circuit breaker for over current protection, the device is often referred to as an RCBO. In the USA, a device that trips on leakages of nominally 5mA and meets certain standards is called a Ground Fault Circuit Interrupter (GFCI). A device meeting the same standards but with a trip level of 30mA is called an Equipment Leakage Circuit Interrupter (ELCI). The devices below provide GFCI Branch or ELCI Main functions and circuit protection in panel mounted breakers.

Features

- Trips on short circuit, overload, or leakage to ground
- For installation in a power distribution panel
- GFCI Branch - Provides overcurrent and leakage protection per ABYC E-11 for head, galley, machinery and weather deck receptacles
- ELCI Main - Provides overcurrent and leakage protection per ABYC E-11 for whole boat shore power protection

Specifications

Iic	Interrupting Capacity	5,000 Amps
Tmno	Temperature Min. Operating	-35°C
Tmxo	Temperature Max. Operating	66°C
Cs	Switching Cycles	10,000 @ rated amperage and voltage
Type		Magnetic Hydraulic—Trip free
Mounting Screw		#6-32 Stainless Steel
Mounting Screw Torque		6–8 in-lb Recommended

Regulatory

3100— UL 1077, UL 943 Class A

3103, 3104, 3102100, 3106100, 3091, 3092, 3093— UL 1077, UL 943 Class A, UL 1500

AC and AC/DC Circuit Breakers Only— CE marked

Part N°	Description	Frame Series	Nominal Voltage	Actuator Style	Ignition Protected	Poles	Itr AC Amperage		Leakage Trip Amps
							MAIN	BRANCH	
3100	GFCI Branch	A-Series	120V AC per pole	Flat Rocker	-	1	-	15A	5mA
3102100	ELCI Main	A-Series	120V AC per pole	Flat Rocker	Yes	2	30A	-	30mA
3103	ELCI Main	C-Series	120V AC per pole	Flat Rocker	Yes	2	50A	-	30mA
3104	ELCI Main	C-Series	120/240V AC per pole	Flat Rocker	Yes	3	50A	-	30mA
3106100	ELCI Main	A-Series	120V AC per pole	White Toggle	Yes	2	30A	-	30mA
3091	ELCI Main	C-Series	230V AC per pole*	Flat Rocker	Yes	2	16A	-	30mA
3092	ELCI Main	C-Series	230V AC per pole*	Flat Rocker	Yes	2	32A	-	30mA
3093	ELCI Main	C-Series	240V AC per pole†	Flat Rocker	Yes	2	50A	-	30mA

* 230V AC, Typical of Europe
† 240V AC, For isolation transformer applications

3100

3102100

3103, 3091, 3092, 3093

3104

3106100