AIRPAX

IAL / IUL / IEL / LEL
Magnetic Circuit Breakers

IAL/IUL/IEL/LEL magnetic circuit breakers provide low-cost power switching, reliable circuit protection and accurate circuit control for equipment in the international market place.

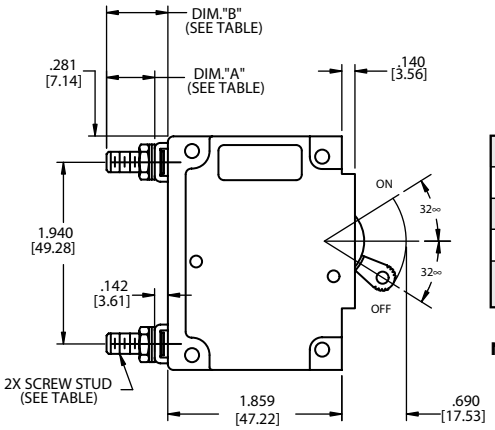
IAL models are for those applications where the unit's inherent attributes are desired, but compliance with the various standards is not required.

IUL models have been tested and approved in accordance with UL 1077 requirements for UL recognition.

IEL/LEL models are VDE approved to VDE 0660, part 101. They meet IEC spacing requirements, mandatory for equipment which must comply with IEC specifications 601 and 950, and VDE specifications 0804 and 0805. In addition, the IEL models are UL recognized to UL 1077 and the LEL models are UL listed under the conditions of UL 489. Both are CSA certified.

Airpax type IAL/IUL/IEL/LEL circuit breakers are available in a wide variety of configurations, including series, series with auxiliary switch, shunt and relay with choice of delays and ratings in DC and/or 50/60Hz or 400 Hz versions. Single or multi-pole versions are available with a variety of pole arrangements to meet your specifications. Please see the appropriate product specification table for ratings and limitations.

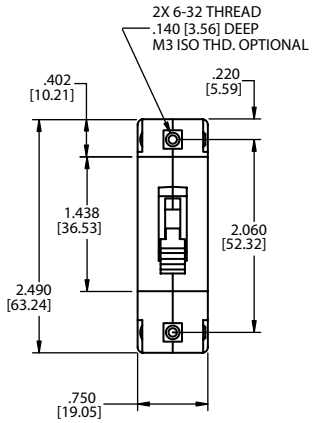
Single Pole, Standard Stud Terminal



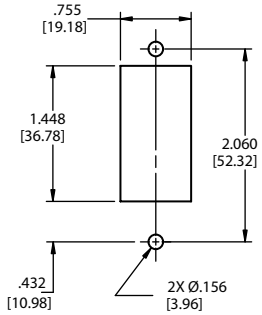
M6	.510	.652
1/4 - 20	.545	.687
M5	.510	.652
10 - 32	.545	.687
Screw stud thread	Dim."A" (± .045)	Dim."B" (± .035)

Note: Each outer terminal is supplied with a flatwasher, tooth lockwasher and a hex nut.

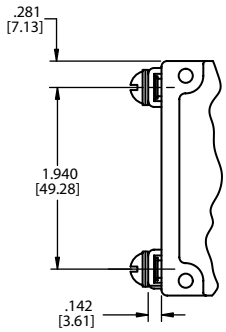
Single Pole



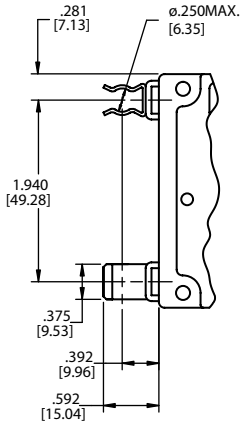
Mounting Detail



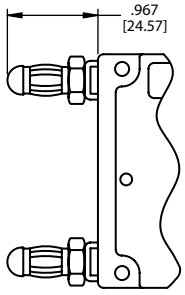
Screw Terminal



Clip Terminal



Bullet Terminal



Notes:
Tolerance ± .015 [.39] unless noted.
Dimensions in brackets [ ] are millimeters.

A Terminal protrusion dimensions are referenced from back of mounting panel.

B Each screw terminal is supplied with a 10-32x.312 [7.92] or M5 x 8mm screw, flatwasher and external tooth lockwasher.

C Stud terminals are supplied with a flatwasher, external tooth lockwasher and a 10-32 or M5 hex nut (<=70A), ¼-20 or M6 hex nut (>70A).

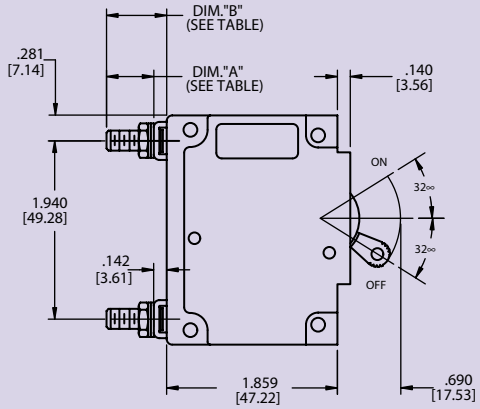
Bullet terminal receptacle should be .312 ± .001 diameter hole not less than .250 depth. Contact Airpax for other bullet sizes.

Multi-pole breakers are combined in an assembly with the trip mechanisms internally coupled. A fault in any protected circuit opens all poles simultaneously. Applications include use in polyphase circuits, single-phase three-wire systems, or in two or more related but electrically isolated circuits. A mix of delays, ratings and configurations are offered. The auxiliary switch is offered with either gold or silver contacts and is available when a series construction pole is specified.

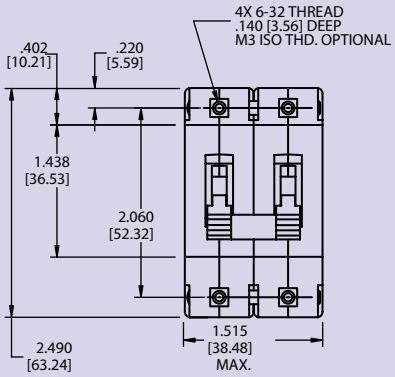
Two Pole Breakers

An assembly consisting of two single pole units, having their trip mechanisms internally coupled, is available with either a single toggle handle or with a handle per pole. Please see decision one of the part number decision tables. Individual poles may vary in ratings, delays and internal configurations. If the poles are of series construction, an auxiliary switch may be included in either or both poles, allowing you to mix SELV and hazardous voltages.

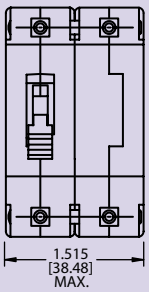
Two Pole



IELH11

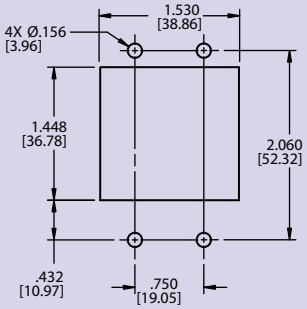


IEL11

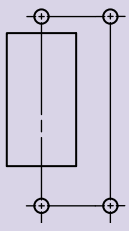


Panel Mounting Detail
Tolerance ±.005 [.13] Unless noted.

Two Pole*



Two Pole*



M6	.510	.652
1/4 - 20	.545	.687
M5	.510	.652
10 - 32	.545	.687
Screw stud thread	Dim."A" (± .045)	Dim."B" (± .035)

Note: Each outer terminal is supplied with a flatwasher, tooth lockwasher and a hex nut.

Note: Tolerance ± .015 [.38] unless noted. Dimensions in brackets [ ] are millimeters.

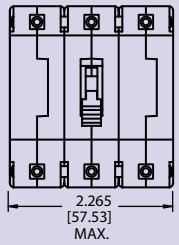
Note: A Terminal protrusion dimensions are referenced from back of mounting panel.
B Each screw terminal is supplied with a 10-32x.312[7.92] or M5 x 8mm screw, flatwasher and external tooth lockwasher.
C Stud terminals are supplied with a flatwasher, external tooth lockwasher and a 10-32 or M5 hex nut (<=70A), 1/4-20 or M6 hex nut (>70A).

Three Pole and Four Pole Breakers

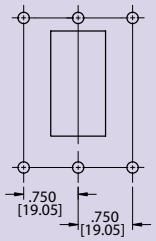
The three pole structure consists of three single pole units assembled with an internal mechanical interlock which actuates all units simultaneously. The units are available with either a single toggle handle or with a handle per pole. Units with four pole construction operate with a minimum of two center toggle handles or with a handle per pole. Please see decision one of the part number decision tables. Mixing of delays, ratings and configurations is available in each individual pole. The auxiliary switch is offered in any series trip pole.

Breaker poles are numbered consecutively when viewed from the terminal side, with the ON position up, starting with pole #1 on the left side and proceeding to the right.

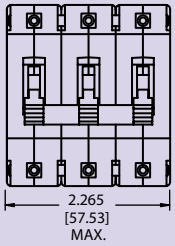
Three Pole



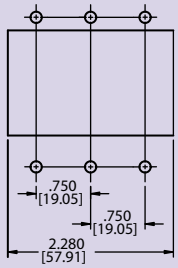
Mounting Detail*



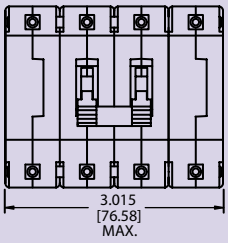
Three Pole



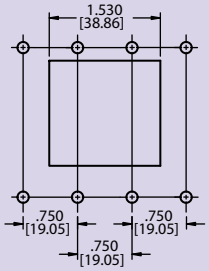
Mounting Detail*



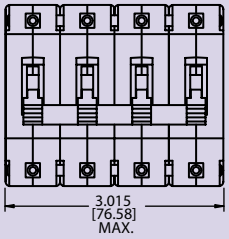
Four Pole



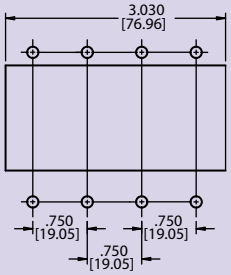
Mounting Detail*



Four Pole



Mounting Detail*



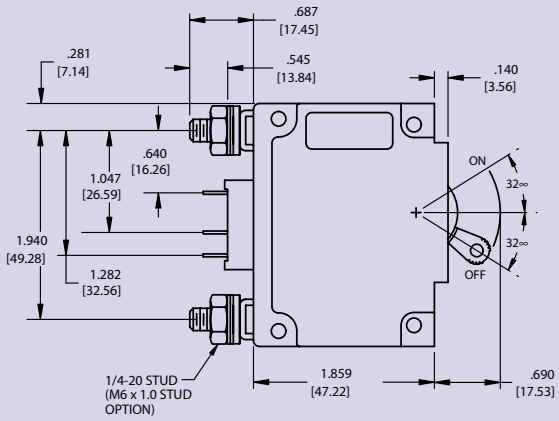
Note: Tolerance ± .015 [.39] unless noted. Dimensions in brackets [ ] are millimeters.
*See Single Pole Mounting Detail for Hole Sizes and Locations.

LELHP MAGNETIC CIRCUIT BREAKERS

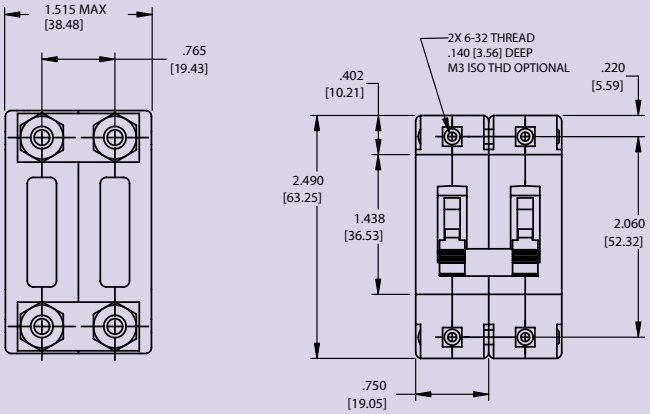
The Airpax LELHP high current magnetic circuit breaker compliments our entire series of LEL circuit breakers. Its unique, parallel current sensing design provides precise current overload protection and reliability in the compact size of a two pole LEL. The unit is ideal for high power DC applications such as drive motor systems and telecommunication power systems.

Available in series and series with auxiliary switch configurations with a choice of delays for DC ratings of 125, 150, 175 and 200 amperes, the LELHP is UL listed under the conditions of UL489 and CSA certified. Mid-trip handle indication, voltage trip and remote operator options complete the LELHP circuit breaker series. Please see the individual product tables for approved ratings.

Contact Airpax for specific part number.

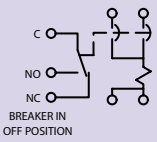


Two Pole

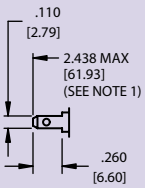


Series Parallel

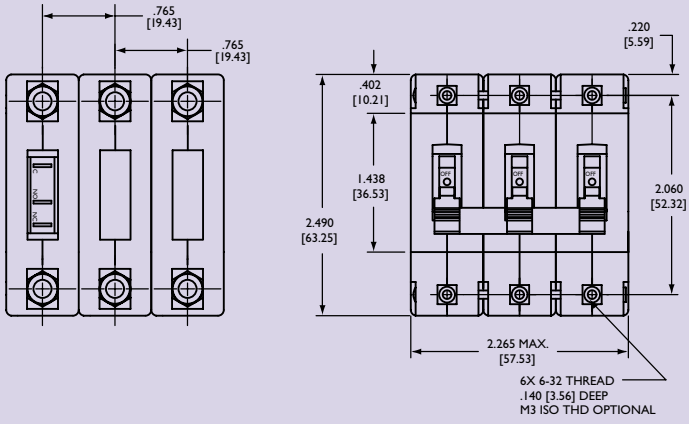
Series Parallel with optional 1REC4 Auxiliary switch



-REC4



Three Pole (Note D)



Notes:

Tolerance ± .015 [.39] unless noted. Dimensions in brackets [ ] are millimeters.

A Terminal protrusion dimensions are referenced from back of mounting panel.

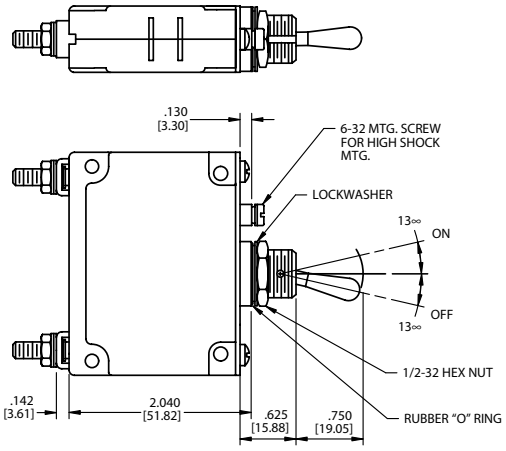
B Each screw terminal is supplied with a 10-32x.312[7.92] or M5 x 8mm screw, flatwasher and external tooth lockwasher.

C Stud terminals are supplied with a flatwasher, external tooth lockwasher and a 10-32 or M5 hex nut (<=70A), $\frac{1}{4}$ -20 or M6 hex nut (>70A).

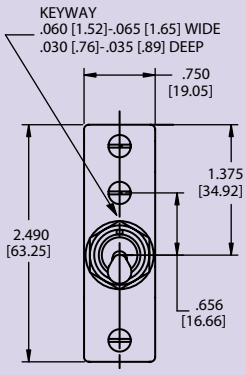
D Units are supplied without bus bars must have a minimum copper strap ($1\frac{31}{32}$ x $\frac{1}{2}$ x $\frac{1}{16}$) of appropriate length to accommodate connections tying each set of terminals together.

The lALN/IULN family is a sealed toggle version of the IAL/IUL family. The silicone rubber seal around the handle assures panel seal integrity and makes this style a natural for harsh environments.

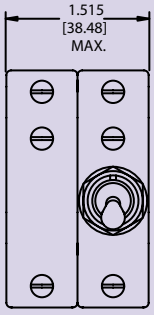
This sealed toggle family is available in one to three pole models with ratings of .050 to 50 amperes. Above 50 amperes consult factory.



Single Pole

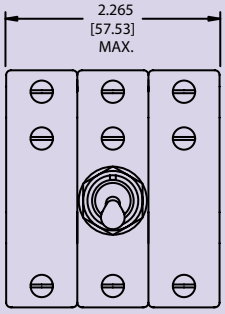


Two Pole



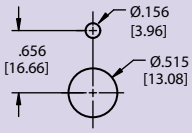
(Optional handle may be in pole 2 instead of pole 1.)

Three Pole

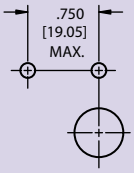


Panel Mounting Details: Tolerance ±.005 [.13] Unless noted.

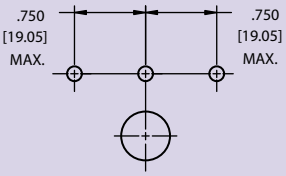
Single Pole



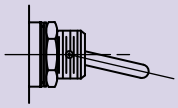
Two Pole*



Three Pole*



Optional handle



*See Single Pole Mounting Detail for Hole Sizes and Locations.

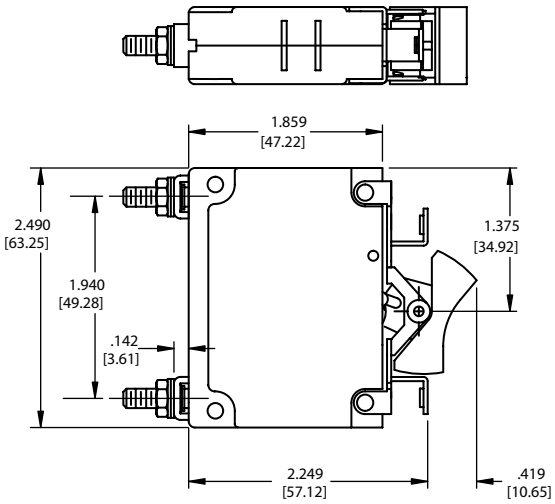
Note: A Terminal protrusion dimensions are referenced from back of mounting panel.
B Each screw terminal is supplied with a 10-32x.312[7.92] or M5 x 8mm screw, flatwasher and external tooth lockwasher.
C Stud terminals are supplied with a flatwasher, external tooth lockwasher and a 10-32 or M5 hex nut (<=70A), ¼-20 or M6 hex nut (>70A).

IALX/IULX/IELX ROCKER HANDLE STYLES

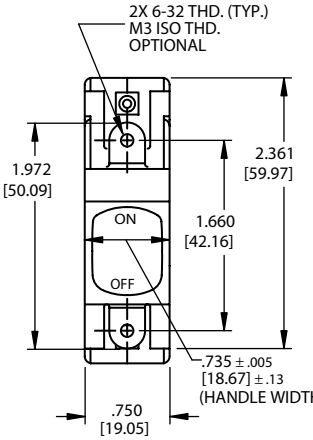
International spacing and aesthetically appealing style come together in our new rocker style handles. Designed with the operator in mind, the handle features a concave surface and is attractive enough to mount on the front of the panel. This can save you real estate behind the panel by eliminating the need to stock and install multiple components.

The rocker style is available in one to four poles. Choose either vertical or horizontal mounting with ON-OFF, international markings or a combination of both. Available .050 to 50 amperes. Above 50 amperes consult factory.

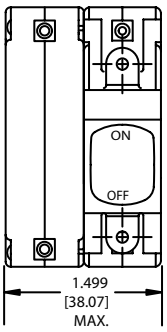
Five front panel enhancing colors including black, white, red, grey and orange are available.



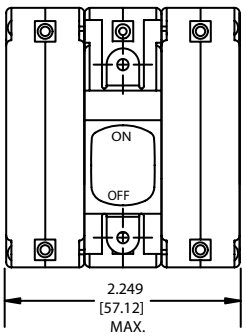
Single Pole



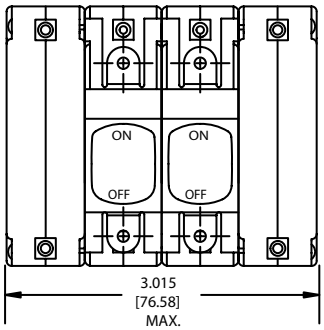
Two Pole



Three Pole



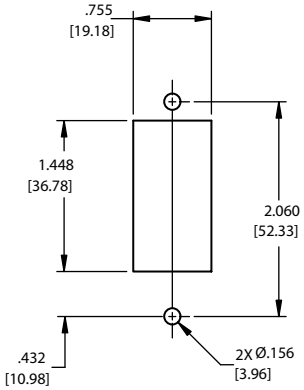
Four Pole



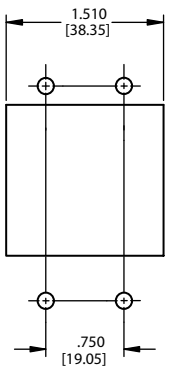
Note: Tolerance ± .015 [.38] unless noted. Dimensions in brackets [ ] are millimeters.

(Optional handle may be in Pole 2 instead of Pole 1.)

Panel Mounting Detail*
Single, Two & Three Pole



Four Pole**

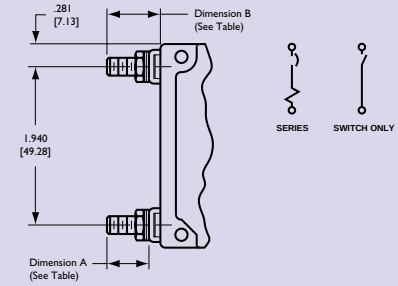


Note: A Terminal protrusion dimensions are referenced from back of mounting panel.
B Each screw terminal is supplied with a 10-32x.312[7.92] or M5 x 8mm screw, flatwasher and external tooth lockwasher.
C Stud terminals are supplied with a flatwasher, external tooth lock washer and a 10-32 or M5 hex nut (<=70A), ¼-20 or M6 hex nut (>70A).

*Mounting detail tolerance ±.005 [.13] Unless noted.
**See single mounting detail for hole sizes and locations.

Series Trip

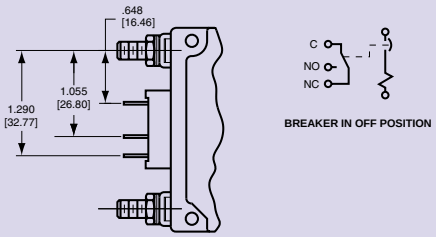
The most popular configuration for magnetic protectors is the series trip where the sensing coil and contacts are in series with the load being protected. The handle position conveniently indicated circuit status. In addition to providing conventional overcurrent protection, it's simultaneously used as an on-off switch.



Shunt Trip

The shunt trip is designed for controlling two separate loads with one assembly. The control is established by providing overload protection for the critical load. When the current through this load becomes excessive and reaches the trip point, the protector will open and remove power from both loads simultaneously. The total current rating of both loads must not exceed the maximum contact rating.

Series with Auxiliary Switch



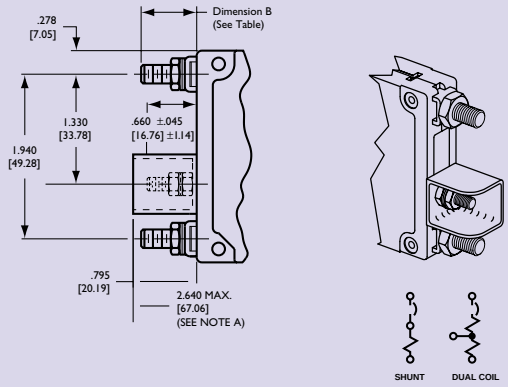
M6	.510	.652
1/4 - 20	.545	.687
M5	.510	.652
10 - 32	.545	.687
Screw stud thread	Dim. "A" (± .045)	Dim. "B" (± .035)

Note: Each outer terminal is supplied with a flatwasher, tooth lockwasher and a hex nut.

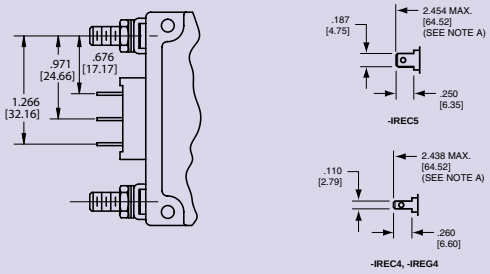
Auxiliary Switch (Applies to Series Trip Only)

This is furnished as an integral part of a series pole in single or multi-pole assemblies. Isolated electrically from the protector's circuit, the switch works in unison with the power contacts and provides indication at a remote location of the protector's on-off status.

Auxiliary switch contacts actuate simultaneously with the main breaker contacts, and will open regardless of whether the breaker contacts are opened manually or electrically. For auxiliary switch ratings below 6Vac or 5Vdc, an auxiliary switch with gold contacts, designated as REG is available. Gold contacts are not recommended for load current above 100 milliamps.



Spacing for VDE Switch

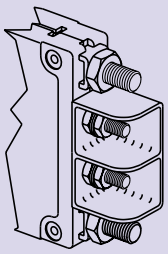


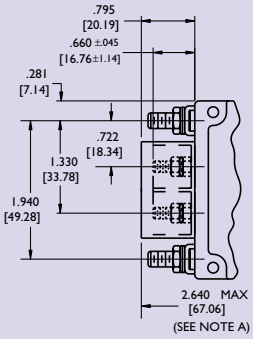
Note: A Terminal protrusion dimensions are referenced from back of mounting panel.
B Each screw terminal is supplied with a 10-32x.312[7.92] or M5 x 8mm screw, flatwasher and external tooth lockwasher.
C Stud terminals are supplied with a flatwasher, external tooth lock washer and a 10-32 or M5 hex nut (<=70A), ¼-20 or M6 hex nut (>70A).

Relay Trip
This permits the overload sensing coil to be placed in a circuit which is electrically isolated from the trip contacts. The coil may be actuated by sensors monitoring pressure, flow, temperature, speed, etc. Other typical applications include crowbar, interlock and emergency/rapid shutdown circuitry. Trip may be accomplished by voltage or current, which must be removed after trip.

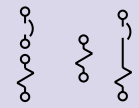
Voltage Trip
Sometimes called "dump circuits" or "panic trip circuits," these units make it possible to open main power contacts with lower power inputs from one or more sources. This configuration is becoming increasingly more important for sensitive circuitry and denser packaging in automation systems. Available in series, shunt or relay configurations.

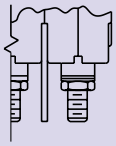
Series and Switch Only

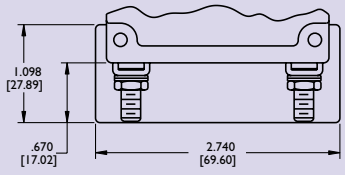




Relay and Dual Coil





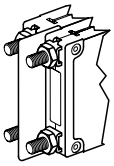


(Optional see page 21, Sixth Decision, Option B)

Notes:
Tolerance ± .015 [.39] unless noted. Dimensions in brackets [ ] are millimeters.
- **A.** Terminal protrusion dimensions are referenced from back of mounting panel.
- **B.** Each screw terminal is supplied with a 10-32x.312[7.92] or M5 x 8mm screw, flatwasher and external tooth lockwasher.
- **C.** Stud terminals are supplied with a flatwasher, external tooth lockwasher and a 10-32 or M5 hex nut (<=70A), ¼-20 or M6 hex nut (>70A).

Barriers

FIG.1



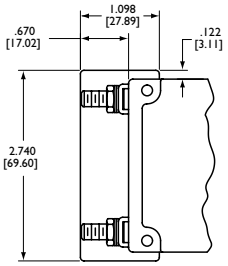
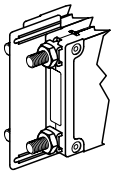


FIG.2



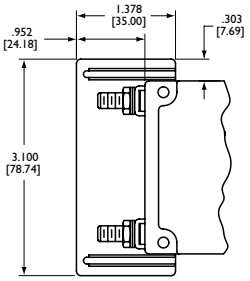
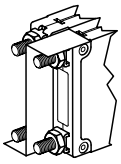


FIG.3



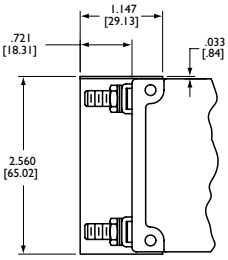
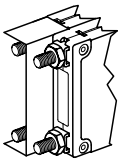
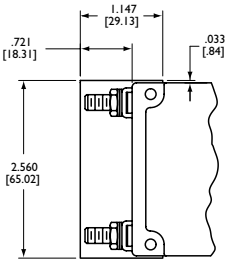


FIG.4





NOTE:
THIS BARRIER CAN BE FLIPPED TO COVER EITHER POLE.

Rating Option	Standard Barrier	
IEL		
240/415Vac	Fig. 1	Std.
415V (VDE)		
277/480Vac		
1/4-20, M6 studs for AC		
120/240Vac multi-pole	Fig. 2	Std.
125Vdc		
LEL		
All multi-pole 50/60Hz	Fig. 2	Std.
All multi-pole 80Vdc if opposite polarity	Fig. 3	Opt.
125Vdc	Fig. 4	Opt.

Note: Optional barrier available with factory assigned part number. Contact factory for assistance.

Mid-Trip Indication

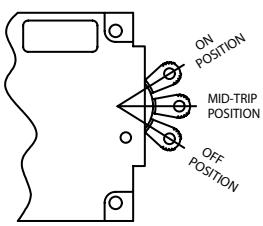
Circuit protection, rapid fault location and alarm capability are blended together in the Airpax mid-trip indication option. This option is designed for automatic handle movement to a middle position upon electrical overload, allowing for easier detection of the fault circuit and minimizing downtime due to the overload condition.

In the optional auxiliary switch configuration, the switch allows an alarm or signal to be forwarded when the breaker trips and the handle moves to the middle position. The alarm can be disengaged by the manual actuation of the handle to the OFF position. Once the fault has been corrected, the circuit breaker can be reset to the ON position. The mid-trip option is available in one, two or three pole toggle handle packages and in either standard panel screw or snap-in mounting. Please see specification tables of specific product for available ratings.

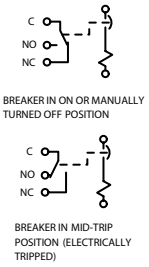
Snap-In Mounting

The snap-in mounting adapter allows for simplified mounting of most IEL/LEL toggle handle products. Prior to shipment, the adapter is attached to the circuit breaker during our final product assembly, allowing you to securely snap the unit into a rectangular panel cut-out. This eliminates the need for panel mounting hardware and associated assembly costs.

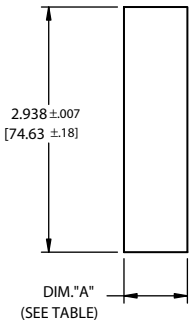
Available for units up to three poles, with or without an option handle guard.

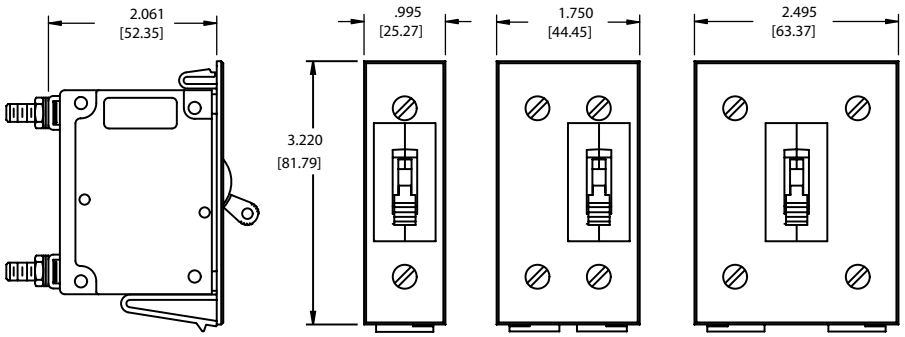


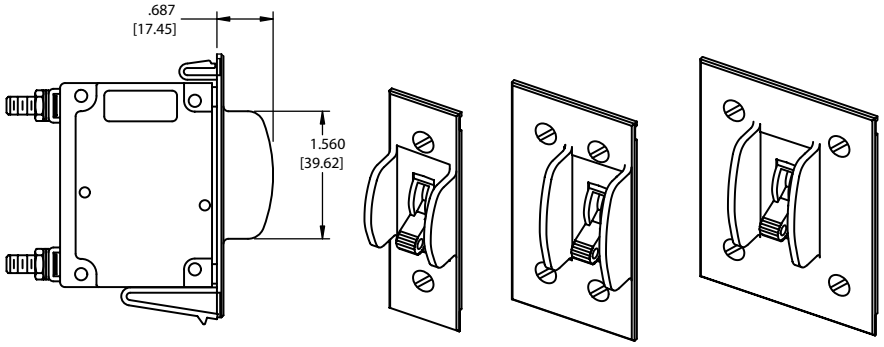
Mid-Trip Handle Positions



Panel Mounting Detail







Panel Mounting Options

Number of Poles	Dimension "A"
1 pole	.760 ± .007
2 pole	1.530 ± .007
3 pole	2.280 ± .007

Panel Thickness
.062 +.005 [1.57+.13]

Note: Tolerance ± .015 [.39] unless noted.
Dimensions in brackets [ ] are millimeters.

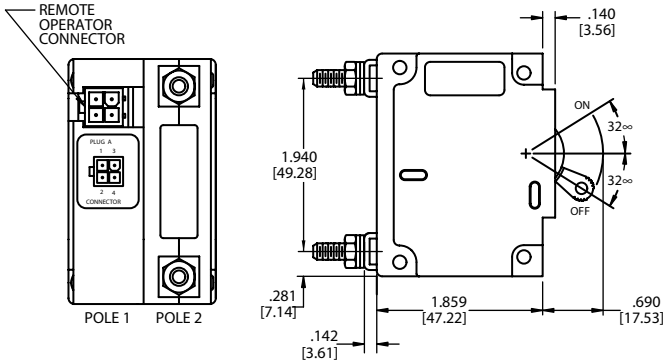
ROCB REMOTE OPERATED CIRCUIT BREAKER

The Airpax Remote Operated Circuit (ROCB) provides the convenience of remote power disconnect and reset capability with the safety and accuracy of a magnetic current sensing device. It allows the operation of the circuit breaker from various locations in the system, facility or site, while not sacrificing the ability to manually operate the breaker if required. Service, diagnostics, load shedding and power distribution control functions can now be performed in areas that were previously unattended, inaccessible or unsafe.

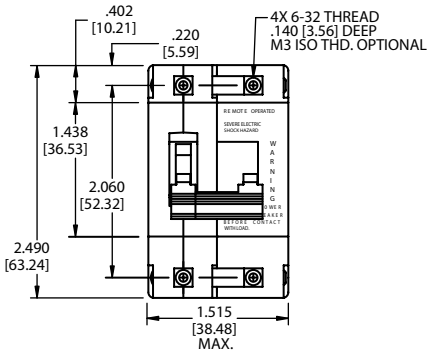
Based on our popular IEL/LEL circuit breaker series, the ROCB shares the same dimensional characteristics (maximum three poles plus the remote operator) for easy adaptation into existing panel designs, yet its compact size allows efficient use of space for new design applications.
In addition, the ROCB has been designed to meet the requirements of domestic and international agency standards for motor operated circuit protection, ensuring worldwide component acceptance.

Contact Airpax for specific part number.

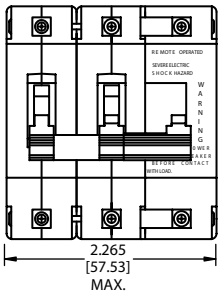
Note: Stud terminal style shown.



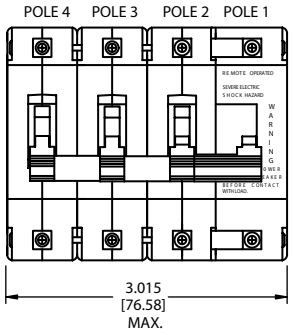
Single Pole



Two Pole

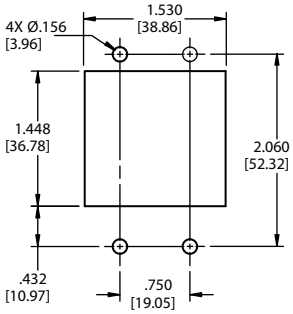


Three Pole

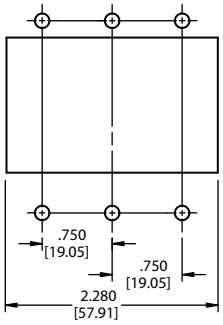


Panel Mounting Details

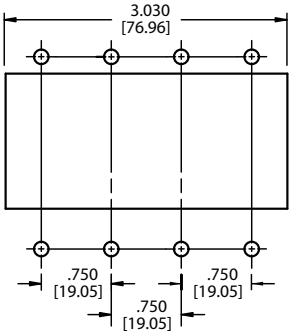
Single Pole



Two Pole*



Three Pole*



Remote Operator Module Specifications
Continuous Input Voltage: 80 Vdc Max., 20 Vdc Min.
Input Ripple Range: 20 Vdc peak to 80 Vdc peak
Maximum Current: Start-up: 1.00 A, Running: 0.30 A
Transit Time: Less than 2 seconds
Endurance: 4,000 operations min.
Dielectric Strength: 1,500 Vac between connector pins and grounded metal. Caution should be taken during dielectric testing. High voltage should not be applied between connector pins.

*See single pole mounting detail for hole sizes and locations.

Panel Mounting Detail:
Tolerance ±.005 [.13]
Unless noted.

Note: Use Amp connector part numbers 172167-1 (housing), and 770988-1 / 171639-1 (pins). Not supplied.

Typical Breaker Resistance/Impedance

Current ratings in amperes	DC Resisitance - Ohms	50/60Hz Impedance - Ohms	400Hz* Impedance - Ohms
	51, 52, 53, 59	61, 62, 63, 69	41, 42, 43, 49
.200	45.8	28.5	71.94
1.0	1.38	1.10	2.85
2.0	.371	.29	.76
5.0	.055	0.51	.12
10.0	.017	.016	.032
20.0	.006	.006	.010
30.0	.003	.004	.006
50.0	.0019	.0018	.006
60.0	.00142	.00121	
70.0	.00138	.00118	
80.0	.00133	.00112	
90.0	.00127	.00107	
100.0	.00127	.00107	
125.0**	.000542		
150.0**	.000494		
175.0**	.00055		
200.0**	.00055		

Notes: DCR and Impedance based on 100% rated current applied and stabalized for a minimum of one hour. Tolerance .05-2.5 amperes ± 20%; 2.6 - 20 amperes ± 25%; 21-200 amperes ± 50% Consult factory for special values and for coil impedance of delays not shown.

Percentage Overload vs Trip Time in Seconds

Delay	100%	125%	150%	200%	400%	600%	800%	1000%
41*	No trip	May trip	.5 - 8	.15 - 1.9	.02 - .4	.006 - .25	.004 - .1	.004 - .05
42*	No trip	May trip	5 - 70	2.2 - 25	.40 - 5	.012 - 2	.006 - .2	.006 - .15
43*	No trip	May trip	35 - 350	12 - 20	1.5 - 20	.012 - 2.2	.01 - .22	.01 - .1
49*	No trip	May trip	.100 max.	.050 max.	.020 max.	.020 max.	.020 max.	.020 max.
51	No trip	.5-6.5	.3 - 3	.1- 1.2	.031 - 5	.011 - .25	.004 - .1	.004 - .08
52	No trip	2-60	1.8 - 30	1 - 10	.15 - 2	.04 - 1	.008 - .5	.006 - .1
53***	No trip	80 - 700	40 - 400	15 - 150	2 - 20	.23 - 9	.018 - .55	.012 - .2
59	No trip	.120 max.	.100 max.	.050 max.	.022 max.	.017 max.	.017 max.	.017 max.
61	No trip	.7 - 12	.35 - 7	.130 - 3	.030 - 1	.015 - .3	.01 - .15	.008 - .1
62	No trip	10-120	6 - 60	2 - 20	.2 - 3	.02 - 2	.015 - .8	.01 - .25
63	No trip	50-700	30 - 400	10 - 150	1.5 - 20	.4 - 10	.013 - .85	.013 - .5
69	No trip	.120 max	.100 max.	.050 max.	.022 max.	.017 max.	.017 max.	.017 max

* Available only in IAL/IUL/IEL; not available in LEL.
** LELHP current ratings, DC only.
*** Not available in LELHP.

400Hz, DC, 50/60Hz Delay Curves (typ)

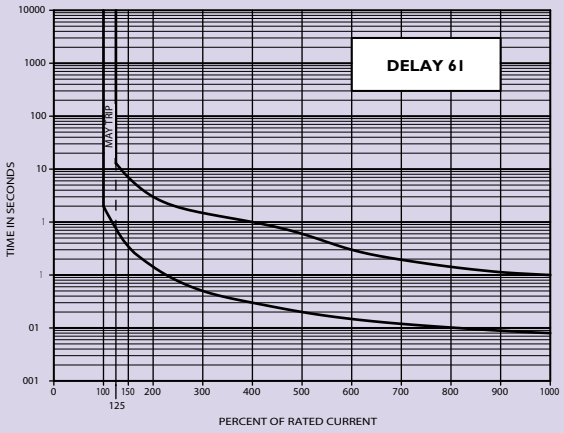
A choice of delays is offered for DC, 50/60Hz, 400Hz, or combined DC/50/60Hz applications. Delays 49, 59, 69 and 79 provide fast-acting, instantaneous tripping and are often used to protect sensitive electronic equipment (not recommended where a known inrush exists). Delays 41, 51, 61 and 71 have a short delay for general purpose applications. Delays 42, 52, 62 and 72 are long enough for most transformers and capacitor loads. Delays 43, 53, 63 and 73 are extra long for special motor applications.

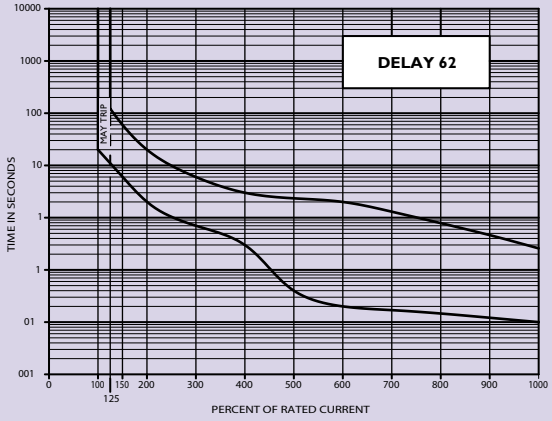
Inrush Pulse Tolerance

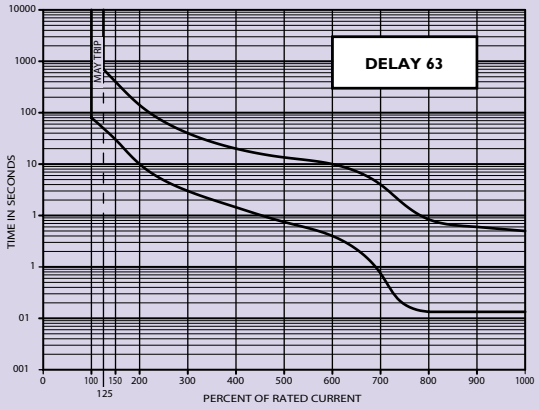
The table on page 13 provides a comparison of inrush pulse tolerance with and without the inertia delay feature for each of the 50/60Hz delays. Pulse tolerance is defined as a single pulse of half sine wave peak current amplitude of 8 milliseconds duration that will not trip the circuit breaker.

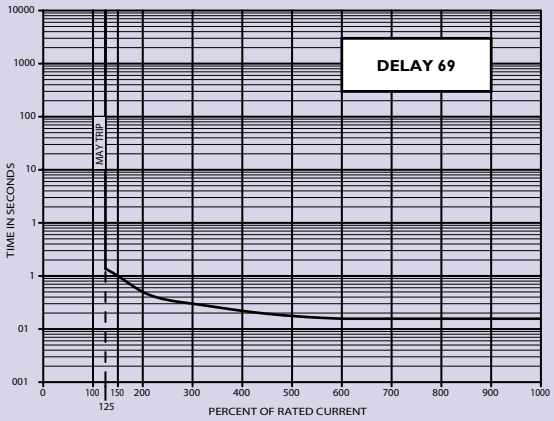
The table below provides a guide to determine if the inertia delay feature is required. Consult factory for further assistance.

Delay	Pulse Tolerance
61, 62, 63 (.1-70 amp.)	12 times (approx.) rated current
61F, 62F, 63F (.1-25 amp.)	20 times rated current
61F, 62F, 63F (25.1-70 amp.)	18 times rated current

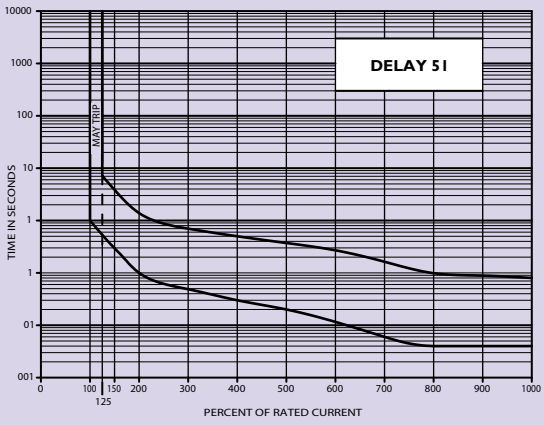


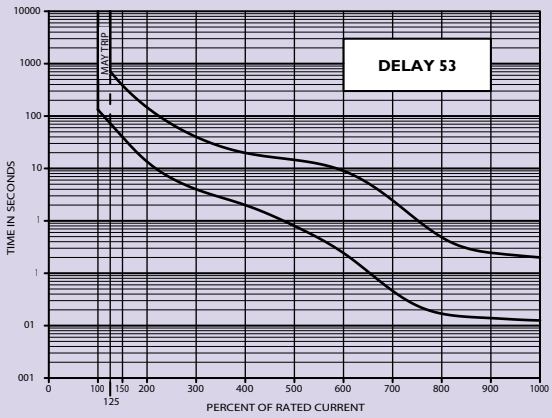


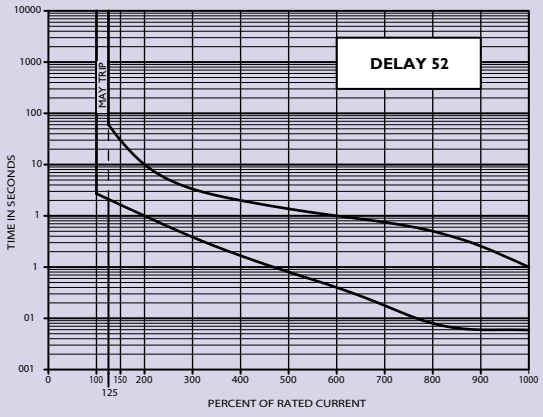


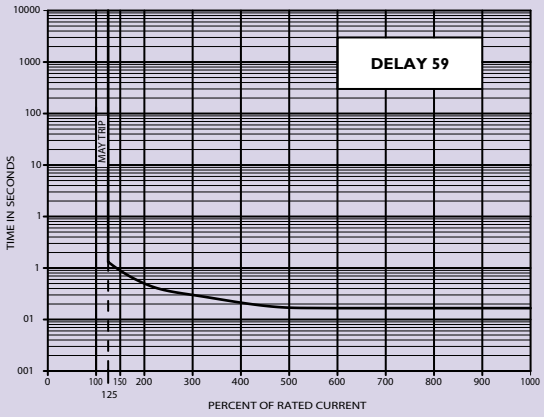


DC Delay Curves (typ)



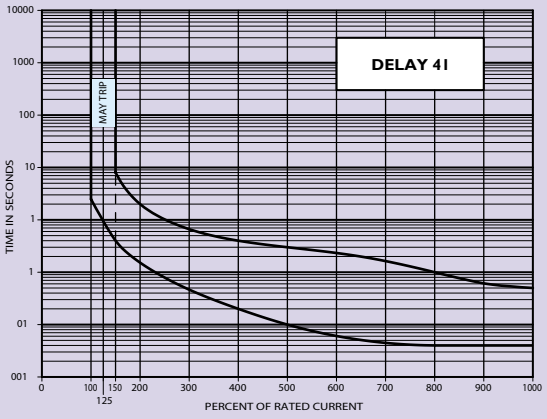


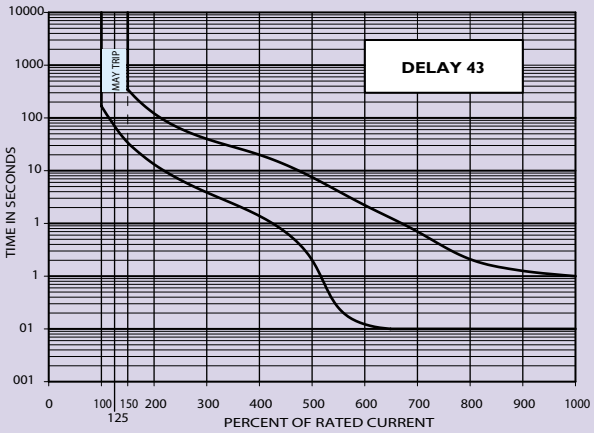


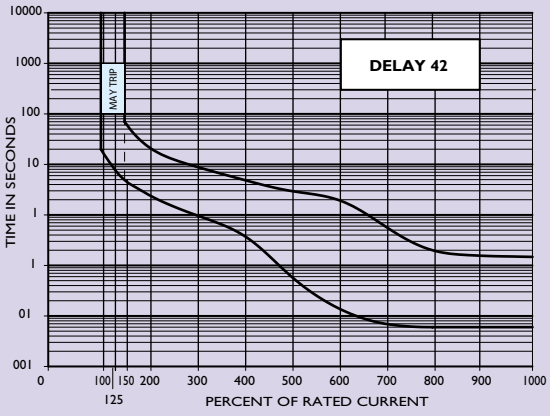


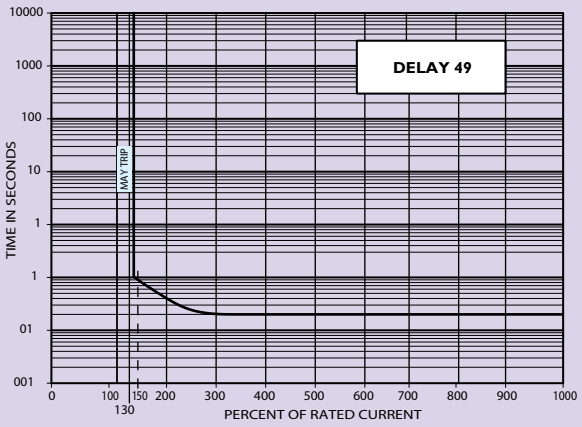
IAL/IUL/IEL DELAY CURVES

400Hz Delay Curves (typ)
*Available only in IAL/IUL/IEL; not available in LEL.



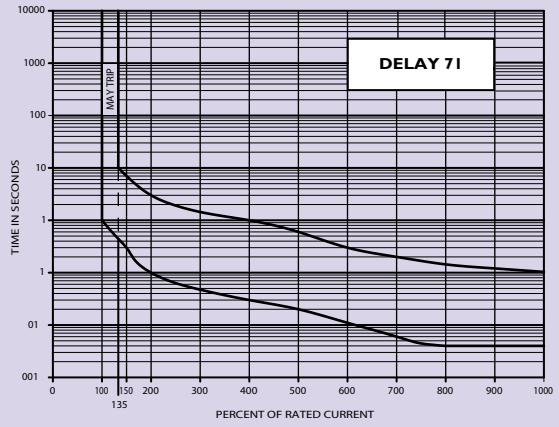


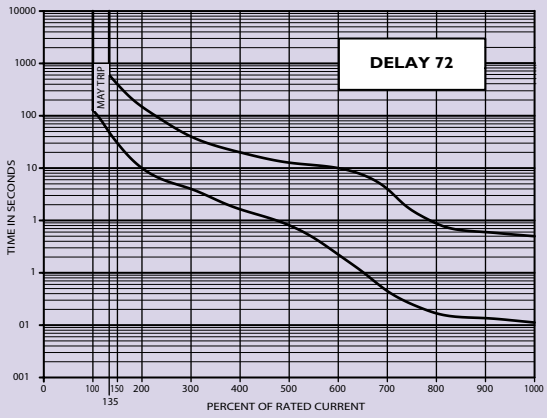


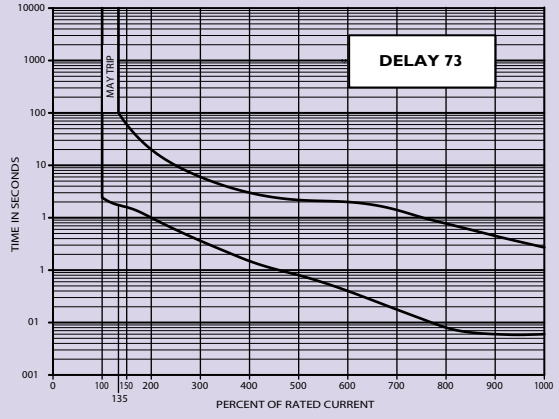


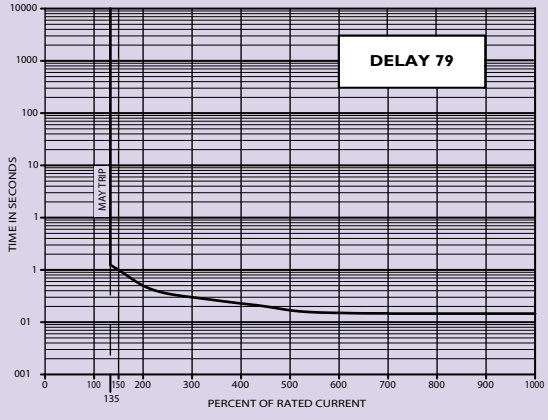
DC/50/60Hz Dual-frequency Delay Curves (typ)

*Available only in IAL/IUL/IEL; not available in LEL.









Trip Free
Will trip open on overload even when forcibly held in the ON position. This prevents the operator from damaging the circuit by holding the breaker on.

Trip Indication
The operating handle moves positively to the OFF or mid-trip position on electrical overload.

Ambient Operation
IAL/IUL/IEL breakers operate in temperatures between -40 degrees C to +85 degrees C.

Insulation Resistance
Not less than 100 megohms at 500 volts DC.

Dielectric Strength
IAL/IUL/IEL breakers withstand 3750Vac (1250Vac for LEL), 60Hz for 60 seconds between all electrically isolated terminals except auxiliary switch terminals shall withstand 600Vac, 60Hz for REG and REC types. Four terminal dual coil and relay construction (not offered in the LEL) will withstand 1500Vac.

Endurance
Operating as a switch, the operating life exceeds 10,000 operations, 6000 at rated load, 4000 without load, at a rate of 6 per minute.

Electrical Characteristics
.050-100 amperes 80Vdc, 240Vac Max., 240/415Vac at 50 amperes Max., 50/60Hz and 400Hz. Consult factory for specific product ratings.

Units rated for 240/415Vac and above 50 amperes are not suitable for across-the-line motor starting.

Poles
One through six poles available.

Construction
Series, shunt, relay dual coil and series with auxiliary switch available in various delays and combinations.

Auxiliary Switch
When supplied shall be S.P.D.T. configuration. Non VDE approved switches have a maximum UL rating of 10.0 amperes, 250 volts, 60Hz; 3.0 amperes, 50 volts DC (REC type) or 0.1 amperes, 125 volts, 60Hz (REG type).

VDE approved switches have a maximum UL rating of 10.0 amperes, 250 volts, 60Hz (REG type); or 0.1 amperes, 125 volts, 60Hz (REG; type). The maximum VDE ratings are 1.0 amperes, 125 volts, 60Hz (REG type); 0.1 amperes, 125 volts, 60Hz (REG type).

Moisture Resistance
Meet all the requirements of MIL-PRF-55629 when tested in accordance with Method 106 of MIL-STD-202.

Salt Spray (Corrosion)
Meet the requirements of MIL-PRF-55629 when tested in accordance with Method 101 of MIL-STD-202.

Shock
Circuit breakers shall not trip when tested per MIL-STD-202, Method 213, Test Condition I with 100% rated current applied to delayed units and 80% rated current to instantaneous units.

Vibration
Circuit breakers shall not trip when vibrated per MIL-STD-202, Method 204, Test Condition A with 100% rated current applied to delayed units and 80% rated current to instantaneous units.

IAL/IUL/IEL
Short Circuit Interrupting Capacities

Rating	Voltage	A.I.C.	Series Fuse
50A max.	240, 50/60Hz	5000	125A max.
50A max.	240, 400Hz	1500	none
100A max.	65 DC	7500	none
70A max.	80 DC	7500	none
† 70A max.	240, 50/60Hz	2000	none
50A max.	240, 50/60Hz	5000	series 209 (100A) 3Ø
50A max.	277, 50/60Hz	5000	125A max.
† 70A max.	125, 50/60Hz	5000	none
†* 50A max.	240/415, 50/60Hz	2000	none
†* 50A max.	240/415, 50/60Hz	5000	125A max.
* 30A max.	277/480, 50/60Hz	2000	none
†* 80A max.	250, 50/60Hz	1000	none
†* 100A max.	120/240, 50/60Hz	2000	none
†* 100A max. (3Ø only)	240, 50/60Hz	2000	none

Note: A clearance of 1 inch for DC and 2 inches for AC is required between the arc vent and any conductive surface or components.
† Not suitable for motor starting applications
* Two poles breaking

LEL
Short Circuit Interrupting Capacities

Rating	Voltage	A.I.C.	Series Fuse
50A max.	65 DC	7500	none
40A max.	125, 50/60Hz	10000	none
50A max.	125, 50/60Hz	5000	none
100A max.	80 DC	10000	none
‡ 70A max.	120/240, 50/60Hz	5000	none
‡‡ 20A max.	240, 50/60Hz	5000	none
* 100A max.	80 DC	50000	none

Note: A clearance of 1 inch for DC and 2 inches for AC is required between the arc vent and any conductive surface or components.
‡ Two poles breaking
‡‡ Single pole only
* Available with factory assigned part number. Contact factory for assistance.

UL-1500 (Marine Ignition Protected)

The IDL/IDLH is certified to UL-1500 (series configuration only), covering ignition protected circuit breakers. This specification requires devices to be used in accordance with the requirements of U.S. Coast Guard and Fire Protection Standard for Pleasure and Commercial Motor Craft, ANSI/MFPA #302.

IDL
Short Circuit Interrupting Capacities

Rating	Voltage	A.I.C.	Series Fuse
60A Max.	65 DC	1000	none
60A Max.	250, 50/60Hz	1000	none

LELHP
Short Circuit Interrupting Capacities

Rating	Voltage	A.I.C.	Series Fuse	Parallel Poles
§ 150A max.	80 DC	10000	none	2
§ 150 max.	65 DC	50000	none	2
§ 200A max.	80 DC	10000	none	3

Note: A clearance of 1 inch for DC is required between the arc vent and any conductive sueface or components.
§ UL listed under the conditions of UL489

Recommended Torque Specifications

6-32 mounting inserts	6 - 8 inch pounds
M3 mounting inserts	4 - 5 inch pounds
10 - 32 screw terminals	14 - 15 inch pounds
M5 screw terminals	14 - 15 inch pounds
10 - 32 stud terminals	13 - 14 inch pounds
M5 stud terminals	13 - 14 inch pounds
¼ - 20 stud terminals	40 - 45 inch pounds

Note: When applicable, mechanical support must be provided to terminals when applying torque.

Approximate Weight Per Pole

Ounces	Grams
3.1	90

How to Order

The ordering code for IAL/IUL/IEL/LEL circuit breakers may be determined by following the decision steps in the appropriate part number decision table subsequent to this page.

The coding given permits a self-assigning part number but with certain limitations. Special applications may require a factory assigned part number. Typical examples are units with mixed ratings, combinations of styles, or constructions not listed in the third decision table, etc. With these, it is suggested that order entry be by description and/or drawings, and a part number will be established. Additionally, it is standard policy to establish a factory-assigned part number whenever a descriptive drawing exists to provide cross reference, traceability and manufacturing control.

When specifying a circuit breaker for AC motor start or high inrush applications, the peak amplitude and surge duration should be specified for factory assistance in rating selection.

For example the code shown is the code for a single pole breaker with a series construction and auxiliary switch, designed for operation in a 50/60Hz circuit. It has a short time delay a rating of 20 amperes and a black marked handle, and is VDE approved.

To determine the ordering number for your particular IAL/IUL/IEL unit, simply follow the steps shown. You may use this number to place an order or as a reference for further questions you may have.

Example:

IEL 1 - 1REC4 - 61 - 20.0 - 01 - V

1 2 3 4 5 7

1 First Decision

Type	Description
IAL **IUL ***IEL	One handle per unit screw terminals
IALH **IULH ***IELH	One handle per pole screw terminals
IALK **IULK ***IELK	One handle per unit stud terminals
IALHK **IULHK ***IELHK	One handle per pole, stud terminals
IALN ***IULN	One handle per unit, panel seal
IALX **IULX ***IELX	One rocker handle per unit
*IDL	Marine ignition One handle per unit
*IDLH	Marine ignition One handle per pole
IALC **IULC ***IELC	Clip terminal One handle per unit
IALHC **IULHC ***IELHC	Clip terminal One handle per pole
***IML	Mid - trip indication, One handle per pole
***IMLK	Mid - trip, stud terminal, One handle per unit
***IMLHK	Mid - trip, stud terminal, One handle per pole
***IMLC	Mid - trip, clip terminal, One handle per unit
***IMLHC	Mid - trip, clip terminal, One handle per pole

*UL Recognized
**UL Recognized, CSA Certified
***UL Recognized, CSA Certified, VDE Approved

V = VDE Approved

The shaded areas denote VDE Approval options. This approval requires the addition of a V at the end of the part number. The V will be added to any part number formed entirely from shaded decisions. If non-shaded areas are selected, the unit will not be VDE approved, but other approvals still apply.

2 Second Decision

Poles

I	Single pole
II	Two pole
III	Three pole
IIII	Four pole*

*Not available in toggle seal handle type. Substitute 0's for 1's, when ordering switch only. Consult factory for 5 and 6 pole IEL part number.

Notes:

IEL, IELH and IELX circuit breakers are designed to meet 8mm creepage clearance requirements for installation Category III, Pollution Degree 3, Case A as measured in IEC 664. Intended for use in equipment to comply with IEC 950, 601 and VDE 0804 & 0805.

3 Third Decision

Internal Configuration

-0	Switch only (omit 4th and 5th decisions)
-1	Series
-1REC4	Series w/ auxiliary switch * .110 quick connect
-1REC5	Series w/ auxiliary switch * .187 quick connect
-1REG4	Series w/ auxiliary switch (gold contacts)* .110 quick connect
-1RS4	Series w/ alarm switch, electrical trip, .110 Q.C. terminals
-1RLS4	Series w/ alarm switch, electrical trip, .110 Q.C. terminals (mid-trip only)
-3	Shunt
-4	Relay (not available in IEL/IELX)

* Only one auxiliary switch is normally supplied on two or three pole units. Switch is located in the right-hand pole (viewed from terminal end) unless otherwise specified.

4 Fourth Decision

Frequency & Delay

-41	400Hz short delay
-42	400Hz long delay
-43	400Hz motor start
-49	400Hz 150% instant trip
-51	DC short delay
-52	DC long delay
-53	DC motor start
-59	DC 125% instant trip
-61	50/60Hz short delay
-62	50/60Hz long delay
-63	50/60Hz motor start
-69	50/60Hz 125% instant trip
-71	DC/60Hz short delay
-72	DC/60Hz long delay
-73	DC/60Hz motor start
-79	DC/60 Hz 135% instant trip

For addition of inertial delay, add an "F" to any delay numberal.

5 Fifth Decision

Rated Current

Standard ratings listed. For other ratings, please contact the factory.

.100	20.0
.250	30.0
.500	35.0
.750	40.0
1.0	50.0
2.5	60.0
5.0	70.0
7.5	80.0
10.0	90.0
15.0	100.0

Use three numbers to print required value between .050 amperes minimum and 100.0 amperes maximum. The VDE (Ith) will be 95% of the UL/CSA rated current

6 Sixth Decision

	Standard hardware. No designation required.
-A	Metric thread mounting terminal and screws.
-B	Barrier
-C	277V (50/60Hz only)
-D	415V (50/60Hz only)
-E	277V/480V (50/60Hz only)
-G	Snap-in face plate adapter with handle guards
-AK	M6 stud terminals
-K	¼ - 20 stud terminals (Required above 70A)
-P	Snap - in face plate adapter
-W	Wire clamp supplied (VDE) approved up to and including 16.0 amps)

Notes:
1. One or more descriptions may be used as required.
2. When this is not used, table one may be substituted and U.S. thread and two lockwashers will be supplied. Unit will be rated at 250V (50/60Hz only).

7 Seventh Decision

Handle Color and Marking Selection

IAL, IUL, IEL, IALH, IULH, IELH - Toggle Handle

Color	Unmarked	Marked* ON-OFF I-O
Black	-00	-01 (STD)
Yellow	-10	-11
Red	-20	-21
Blue	-30	-31
Green	-40	-41
Orange	-60	-61
White	-90	-91

IALX, IULX, IELX Rocker Handle

		Marked*		
		Vertical Mtg.		
Color	Un-Marked	On-Off Fig. 1	I-O Fig. 2	On-Off I-O Fig. 3
Black	-00	-01	-02	-03
Red	-20	-21	-22	-23
Grey	-40	-41	-42	-43
Orange	-50	-51	-52	-53
White	-90	-91	-92	-93
		Horizontal Mtg.		
Color	Un-Marked	On-Off Fig. 4	I-O Fig. 5	On-Off I-O Fig. 6
Black	-00	-04	-05	-06
Red	-20	-24	-25	-26
Grey	-40	-44	-45	-46
Orange	-50	-54	-55	-56
White	-90	-94	-95	-96

* Handle marking color is white on black, red, blue, & green handles and black on white, yellow, grey & orange handles.

Fig. 1 Fig. 2 Fig. 3 Fig. 4 Fig. 5 Fig. 6

LEL DECISION TABLES

Example:

LEL 1 - 1REC4 - 61 - 20.0 - 01 - V

1 2 3 4 5 7

1 First Decision

Type

LEL	One handle per unit, Screw terminals
LELH	One handle per pole, Screw terminals
LELC	One handle per unit, Clip terminals
LELK	One handle per unit, Stud terminals
LELHK	One handle per pole, Stud terminals,
LML	One handle per unit, Screw terminals, mid-trip
LMLH	One handle per pole, Screw terminals, mid-trip
LMLK	One handle per unit, Stud terminals, mid-trip
LMLHK	One handle per pole, Stud terminals, mid-trip
LMLC	One handle per unit, Clip terminals, mid-trip

2 Second Decision

Poles

1	Single pole
11	Two pole
111	Three pole

Notes:
The LEL family of circuits are designed to meet 8mm creepage and clearance requirements for installation Category 111, pollution degree 3, Case A as measured in IEC 664. Intended for use in equipment designed to comply with IEC 380, 435, 601 AND VDE 0730, 0804 & 0805.

3 Third Decision

-1	Series
-1REC4	Series with auxiliary switch .110 quick connect
-1REC5	Series with auxiliary switch .187 quick connect
-1REG4	Series with auxiliary switch (gold contacts) .110 quick connect
-1RS4	Series with alarm switch, electrical trip, .110 quick connect
-1RSG4	Series with alarm switch, electrical trip, (gold contacts) .110 quick connect
-1RLS4	Series with alarm switch, electrical trip, .110 quick connect*

* Used only with mid-trip.

4 Fourth Decision

Frequency and Delay

-51	DC short delay
-52	DC long delay
-53*	DC motor start
-59	DC 125% instant trip
-61	50/60Hz short delay
-62	50/60Hz long delay
-63	50/60Hz motor start
-69	50/60Hz 125% instant trip

For addition of inertial delay, add an "F" to any delay numeral.
*Not available above 50 amps.

5 Fifth Decision

Rated Current

Use three numbers to print. Required value between .050 amps minimum and 100 amps maximum.

6 Sixth Decision

Optional

-A	Metric thread mounting terminals and screws
-G	Snap-in mounting plate adapter with handle gaurds
-P	Snap-in mounting plate adapter
-T	80Vdc 10,000 A.I.C.
-K	¼ - 20 Stud (required above 70 amps.)
-U	120/240Vac, 5000 A.I.C., 50A max. 2 pole only with barrier

Notes:
1. One or more descriptions may be used as required.
2. When this decision is not used, decision 7 may be substituted and U.S. thread will be supplied.
3. If (M5 or M6) studs are required, use "A" only on an LELK

7 Seventh Decision

Handle Color Selection

-01	Black w/ white markings
-11	Yellow w/ black markings
-21	Red w/ white markings
-31	Blue w/ white markings
-41	Green w/ white markings
-61	Orange w/ black markings
-91	White w/ black markings

V = VDE Approved

The shaded areas denote VDE Approval options. This approval requires the addition of a V at the end of the part number. The V will be added to any part number formed entirely from shaded decisions. If non-shaded areas are selected, the unit will not be VDE approved, but other approvals still apply.

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