# L-Series
## CIRCUIT BREAKER

The L-Series high performance, compact hydraulic- magnetic circuit breaker is ideally suited for the rigors and confined spaces found in today's telecom/datacom power distribution units and rack systems. It provides best in class performance in an innovative low profile, space saving package complementing the overall spatial objectives required by telecommunications and data-communications systems designers in their quest to reduce the overall size of equipment, while increasing transmission capacity.

With the integration of an optional current transformer, the L-Series is capable of sensing current down to a level of 1%. This optional capability provides precise current monitoring and reporting required for back billing of the actual power consumed by datacenter storage and routing devices. This feature also facilitates load adjustments and maximizes efficiency. Further, a patent pending flush rocker actuator design and optional push-to-reset guard offers additional protection against accidental switching.

Number of poles: 1-3 poles;. Max current/voltage ratings: .1-32A, 120/240-240VAC. Max interrupting capacity: 5000 Amps


### Product Highlights:

- Optional current transformer
- Ultra low profile design saves valuable space
- Optional handle guard actuator
- UL 489 LISTED Branch Circuit breaker
- Designed for worldwide datacenter compatibility with up to 240VAC ratings

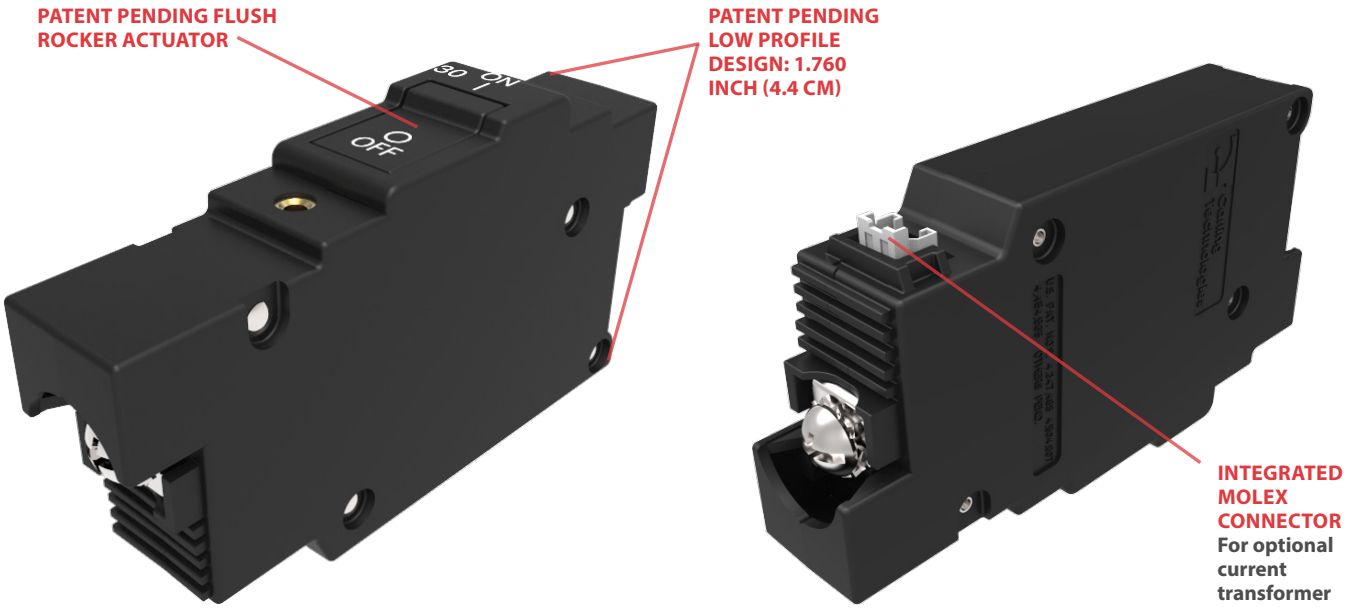
### Typical Applications:

- Telecom/Datacom

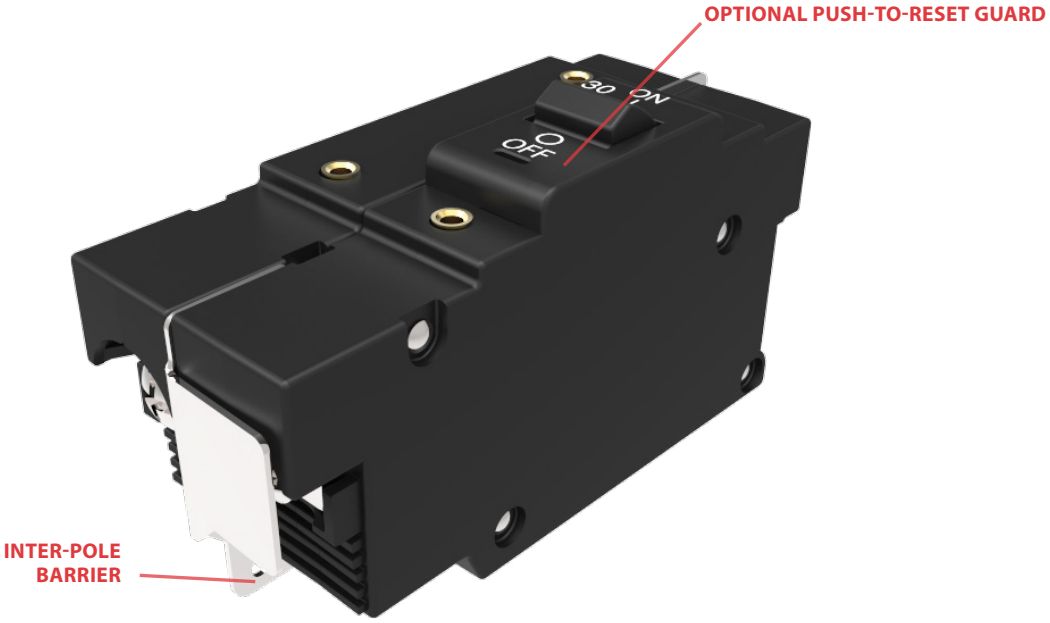
Carling Technologies®
Innovative Designs. Powerful Solutions.

# L-Series
## DESIGN FEATURES

### 1–Pole Configuration with Low Profile Rocker Actuator




### 2–Pole Configuration with Push-To-Reset Guard

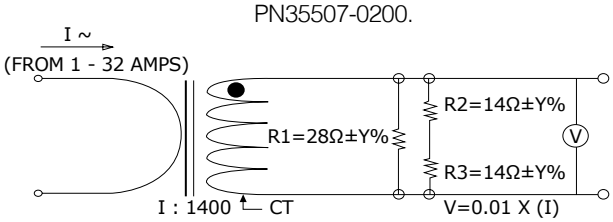


## Electrical

| | |
|---|---|
| Maximum Voltage | AC, 415Y/240VAC (see table A)<br>UL489, AC, 240VAC (see table A) |
| Current Metering | Integrated current transformer.<br>Measurement range: 1-32 Amps<br>Voltage output: 10mV per Amp<br>according to the formula below:<br>2 (Amp) ≤ I ≤ 32(Amp)<br>V = 0.01× I ± 2%<br>(with current metering codes 1 or 2)<br>V = 0.01× I ±1%<br>(with current metering codes 3 or 4) |

$$\left| \frac{\left[\frac{V}{I} - \frac{V_{10}}{I_{10}}\right]}{\frac{V_{10}}{I_{10}}} \right| \leq 0.85\%$$

Where V=CT output in volts $V_{10}$=CT output in volts with I=$I_{10}$=10 (A); I=primary current in amperage (50/60 Hz). Phase shift between primary current and CT output is 0.25±0.25°. Maximum crest factor of primary current is 1.73.
R1 shall be integrated in the breaker. R2 and R3 are provided by end user and external to the breaker.
Connection: below Load Terminal. 2-pin connector, Molex 35362-0250. Mating Connector housing – Molex PN35507-0200.




Note: When current metering code is 1 or 2; Y to equal 1.0
When current metering code is 3 or 4; Y to equal 0.1

| | |
|---|---|
| Dielectric Strength | UL, CSA-1960V 50/60 Hz for one minute between all electrically isolated terminals. Comply with the 8mm spacing and 3750V 50/60 Hz dielectric requirements from hazardous voltage to operator accessible surfaces and between main circuits of adjacent poles per Publications EN 60950 & VDE 0805 |
| Impedance | See next page |
| Insulation Resistance | Minimum of 100 Megohms@500VDC |
| Overload | 50 operations @ 600% of rated |
| Interrupt Capacity | See Table A |

## Agency Approvals

UL489, cUL, TUV (EN60934)

## Environmental

| | |
|---|---|
| Environmental | MIL-PRF-55629 and MIL-STD-202G |
| Operating Temp | -40°C to +85 °C |
| Vibration | Withstands 0.06" excursion from 10-55 Hz and 10Gs 55-500 Hz at rated current per MIL-PRF-55629 and MIL-STD-202G, Method 204D, Test Condition A. Instantaneous and ultra-short curves tested at 90% of rated current. |
| Shock | Withstands 100 Gs, 6 ms saw tooth while carrying rated current per MIL-PRF-55629 and MIL-STD-202G, Method 213B, Test Condition "I". Instantaneous and ultra short curves tested at 90% of rated current. |
| Thermal Shock | MIL-PRF-55629 and MIL-STD-202G, Method 107G, Condition A (5-cycles at -55°C to +25°C to +85°C to +25°C). |
| Moisture Resistance | MIL-PRF-55629 and MIL-STD-202G, Method 106G, i.e., Ten 24-hour cycles at +25°C to +65°C, 80-98% RH. |
| Salt Spray | Method 101, Condition A (90-95% RH @ 5% NaCl Solution, 96hrs) |

## Physical

| | |
|---|---|
| Number of Poles | 1-3 poles |
| Termination | Screw Terminals with the following thread sizes: 10-32, 8-32, M5, M4 |
| Termination Barrier | Standard for 2 & 3 poles |
| Mounting | Threaded Insert: #6-32 UNC-2B, or M3X0.5-6H B ISO (2 per Pole) |
| Actuator | Rocker, with or without guard |
| Internal Circuit Config. | Series Trip |
| Materials | Housing - Glass Filled Polyester<br>Rocker – Nylon 6/6<br>Line/Load Terminals – Copper Alloy; Bright Acid Tin Plated |
| Weight | ~107 Grams (~3.76 Ounces) per pole |
| Standard Color | Housing - Black<br>Rocker - Black |

## Mechanical

| | |
|---|---|
| Endurance | 10,000 "On-Off" Operations @ 6 per minute; with rated Current & Voltage. |
| Trip Free | Trips on overload even when actuator is forcibly held in the "On" position. |
| Trip Indication | The operating actuator moves positively to the "Off" position when an overload causes the breaker to trip |

*Manufacturer reserves the right to change product specification without prior notice.

## Electrical Tables

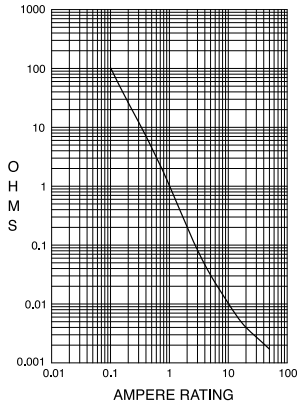
**Table A:** Voltage, Current and IC Ratings

| L-SERIES TABLE A: VOLTAGE, CURRENT AND AIC RATINGS | | | | | | | |
|---|---|---|---|---|---|---|---|
| VOLTAGE | CURRENT (AMPS) | NUMBER OF POLES | PHASE | CURRENT METERING | INTERRUPT CAPACITY (AMPS) | | |
| | | | | | UL 489 (Amps) | EN60934 | |
| | | | | | | (Icn) without Backup Fuse | (Inc) with Backup Fuse |
| 240 VAC | 0.1 - 32 | 1 | 1 | Yes | 5000 | 3000 | 10000 |
| 240 VAC | 0.1 - 32 | 2* | 1 | Yes | 5000 | 3000 | 10000 |
| 240 VAC | 0.1 - 20 | 3 | 3 | Yes | 5000 | 3000 | 5000 |
| 415/240 VAC | 0.1 - 20 | 3 | 3 | Yes | ––– | 3000 | 5000 |
| 120/240 VAC | 0.1 - 32 | 2 | 1 | Yes | 5000 | N/A | N/A |
| 120/240 VAC | 0.1 - 32 | 3** | 1 | Yes | 5000 | N/A | N/A |

Notes:
* Breaking both sides of the line
** 3rd pole to be neutral break

**Electrical:** Impedance (Across circuit breaker main terminals)

RESISTANCE, IMPEDANCE VALUES
from Line to Load Terminals
(Values Based on Series Trip Circuit Breaker)




| CURRENT (AMPS) | TOLERANCE (%) |
|---|---|
| 0.10 - 5.0 | +/- 15 |
| 5.1 - 32.0 | +/- 25 |

| L | 1 | 1 | – | B | 0 | – | 24 | – | 620 | – | 4 | 2 | 1 | – | D | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Series | 2 Actuator | 3 Poles | | 4 Circuit | 5 Current Metering | | 6 Frequency & Delay | | 7 Current Rating | | 8 Terminal | 9 Actuator Color & Legend | 10 Mounting | | 11 Rating | 12 Agency Approval |

### 1 SERIES
**L**

### 2 ACTUATOR
**1** Single Color Low Profile Rocker, Vertical Legend
**2** Single Color Low Profile Rocker, Horizontal Legend
**3** Single Color Push to Reset Low Profile Rocker, Vertical Legend
**4** Single Color Push to Reset Low Profile Rocker, Horizontal Legend

### 3 POLES
**1** One
**2** Two
**3** Three

### 4 CIRCUIT
**B** Series Trip (current)

### 5 CURRENT METERING
**0** Without Current Transformer
**1** [2] Integrated Current Transformer, +/- 2%, 1 per unit
**2** Integrated Current Transformer, +/- 2%, 1 per pole
**3** [2,6] Integrated Current Transformer, +/- 1%, 1 per unit
**4** [6] Integrated Current Transformer, +/- 1%, 1 per pole

### 6 FREQUENCY & DELAY
**20** [5] 50/60Hz Instantaneous
**21** 50/60Hz Ultra Short
**22** 50/60Hz Short
**24** 50/60Hz Medium
**26** 50/60Hz Long
**42** 50/60Hz Short, High-inrush
**44** 50/60Hz Medium, High-inrush
**46** 50/60Hz Long, High-inrush

### 7 CURRENT RATING (AMPERES)

| CODE | AMPERES | CODE | AMPERES | CODE | AMPERES |
|---|---|---|---|---|---|
| **410** | 1.000 | **460** | 6.000 | **613** | 13.000 |
| **512** | 1.250 | **465** | 6.500 | **614** | 14.000 |
| **415** | 1.500 | **470** | 7.000 | **615** | 15.000 |
| **517** | 1.750 | **475** | 7.500 | **616** | 16.000 |
| **420** | 2.000 | **480** | 8.000 | **617** | 17.000 |
| **522** | 2.250 | **485** | 8.500 | **618** | 18.000 |
| **425** | 2.500 | **490** | 9.000 | **620** | 20.000 |
| **527** | 2.750 | **495** | 9.500 | **622** | 22.000 |
| **430** | 3.000 | **610** | 10.000 | **624** | 24.000 |
| **435** | 3.500 | **710** | 10.500 | **625** | 25.000 |
| **440** | 4.000 | **611** | 11.000 | **630** | 30.000 |
| **445** | 4.500 | **711** | 11.500 | **632** | 32.000 |
| **450** | 5.000 | **612** | 12.000 | | |
| **455** | 5.500 | **712** | 12.500 | | |

### 8 TERMINAL
**2** Screw Terminal, 8-32 (Bus Type)
**4** Screw Terminal, 10-32 (Bus Type)
**E** Screw Terminal, M4 (Bus Type)
**H** Screw Terminal, M5 (Bus Type)

### 9 ACTUATOR COLOR & LEGEND

| Actuator Color | I-O | ON-OFF | Dual | Legend Color |
|---|---|---|---|---|
| White | **A** | **B** | **1** | Black |
| Black | **C** | **D** | **2** | White |
| Red | **F** | **G** | **3** | White |
| Green | **H** | **J** | **4** | White |
| Blue | **K** | **L** | **5** | White |
| Yellow | **M** | **N** | **6** | Black |
| Gray | **P** | **Q** | **7** | Black |
| Orange | **R** | **S** | **8** | Black |

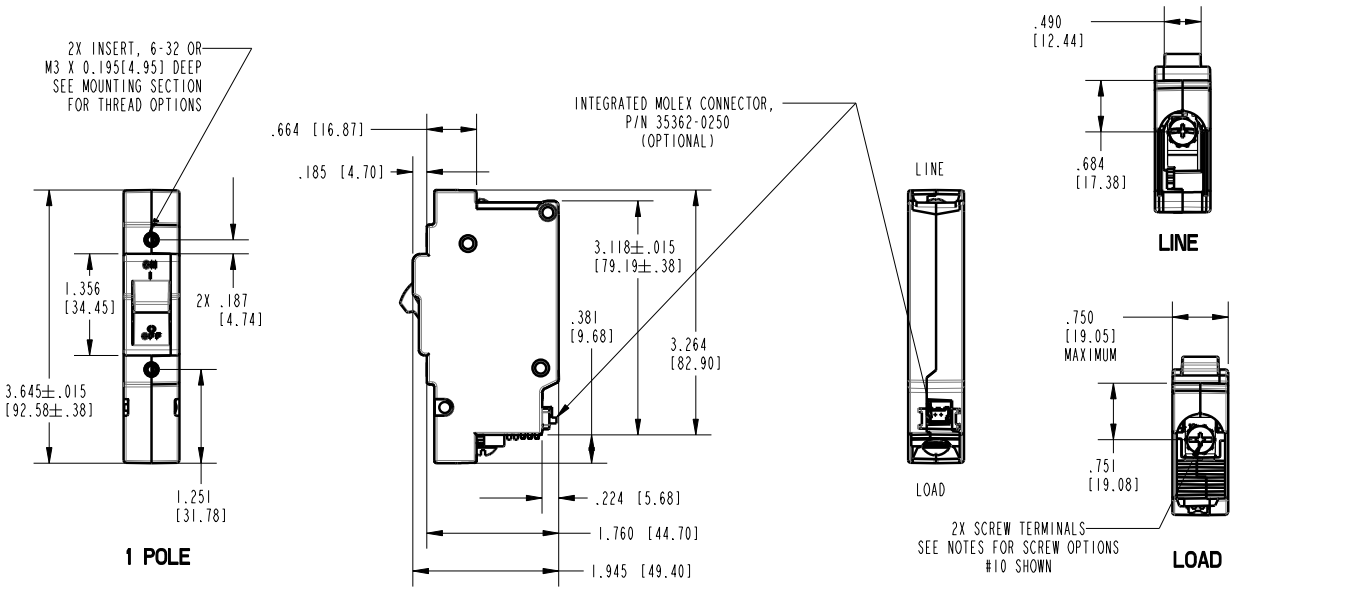
### 10 MOUNTING INSERTS [3]
**1** 6-32 X .195 Threaded Inserts
**A** 6-32 X .195 Threaded Inserts with Terminal Barrier
**2** ISO M3 X 5 mm Threaded Inserts
**B** ISO M3 X 5 mm Threaded Inserts with Terminal Barrier

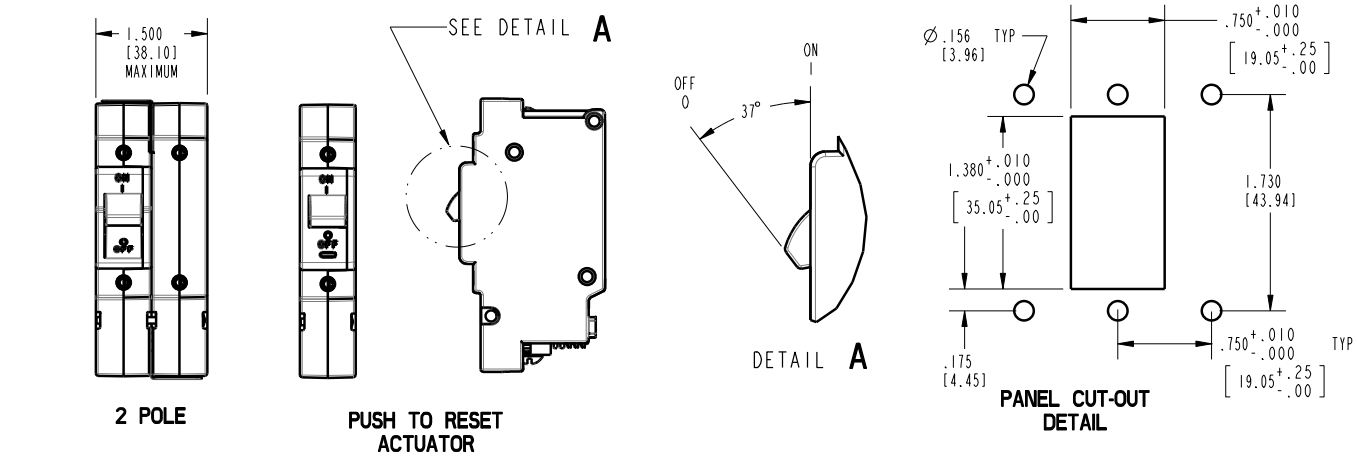
### 11 MAX. APPLICATION RATING
**C** [1] 120/240 VAC (2 or 3 Pole only)
**D** 240 VAC
**P** [4] 415Y/240 VAC (TUV only) 240 VAC 3 phase Delta

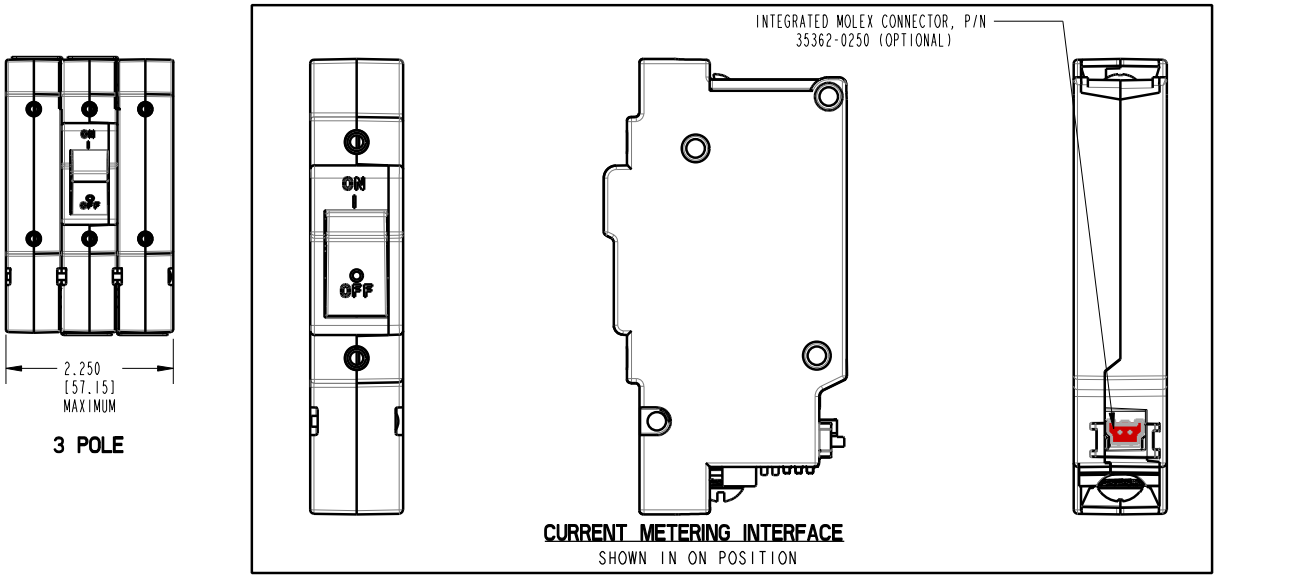
### 12 AGENCY APPROVAL
**A** Without approvals
**G** UL 489 Listed
**3** UL 489 Listed, TUV Certified

Notes:
1 3 Pole units available only when one of three poles is neutral
2 On Multi Pole units one current transformer is supplied on the actuator pole
3 Terminal barriers are required on multi poles breaker
4 Voltage rating P only available as a 3 pole device 20A max
5 Only available with approval code "A"
6 +/-1% tolerance only available when used with +/-0.1% tolerance external burden resistor.

## Dimensional Specifications: in. [mm]




Notes:
1 All dimensions are in inches [millimeters].
2 Screws have combination head
3 Screw thread options: #8-32, #10-32, M4X.7, M5X.8