Carling Technologies’ high-performance N-Series hydraulic-magnetic circuit breaker is ideally suited for the rigors and confined spaces of telecom and datacom power distribution units and rack systems. Its innovative, low profile design features easily accessible load and line terminals and sliding barriers for effortless installation.

With the integration of an optional current transformer, the N-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. A patent pending, flush-rocker actuator and push-to-reset guard offer additional protection against accidental switching.

1-2 poles; ratings: 1-30 amps up to 240 VAC, 277 VAC, 120/240 VAC; 22,000 Amps Max Interrupting Capacity; UL 489 Compliant Sliding Terminal Barriers; EN60947-2 Certified

**Product Highlights:**
- 240 VAC, 277 VAC, 120/240 VAC
- UL 489 Compliant Sliding Terminal Barriers
- 22,000 Amps Max Interrupting Capacity
- 1 – 30 Amps Current Rating
- Optional Current Transformer
- EN60947-2 Certified

**Typical Applications:**
- Telecom/Datacom
  - PDU’s
  - Data Servers
  - Data Storage

**Resources:**
- Configure a Complete Part
- Download CAD & Sales Drawing
- Watch Product Video
N-Series
DESIGN FEATURES

CURRENT TRANSFORMER
Remote current sensing via molex connector

UPPER ARC RUNNER
Optional, for 277 VAC rated breakers

GRIDS (5x)
Arc deionizing splitter plates that increase arc voltage for quick interrupt

TERMINAL
Allows for easy hook-up of wires on both sides of the breaker

"LOAD"

"LINE"

UPPER ARC RUNNER
Motivates arc off of the stationary contact

SLIDING TERMINAL BARRIERS

GRIDS (5x)
Arc deionizing splitter plates that increase arc voltage for quick interrupt
### Electrical

**Current Metering**
- Integrated current transformer.
- Measurement range: 1-30 Amps.
- Voltage output: 10mV per Amp according to the formula below:
  
  \[ V = 0.01 \times I \pm 2\% \]

  (with current metering codes 1 or 2)

  \[ V = 0.01 \times I \pm 1\% \]

  (with current metering codes 3 or 4)

  \[
  \frac{V_{10}}{I_{10}} \leq 0.85\%
  \]

  Where \( V = \text{CT output in volts} \)

  \( V_{10} = \text{CT output in volts with} \)

  \( I = I_{10} = 10 \text{ (A);} \)

  \( I = \text{primary current in} \)

  \( \text{amperage (50/60 Hz). Phase shift} \)

  \( \text{between primary current and CT} \)

  \( \text{output is 0.25±0.25°. Maximum} \)

  \( \text{crest factor of primary current is 1.73.} \)

  \( R_1 \) shall be integrated in the breaker.

  \( R_2 \) and \( R_3 \) are provided by end user

  \( \text{and external to the breaker.} \)

  Connection: below Load Terminal.

  2-pin connector, Molex 35362-0250.

  Mating Connector housing – Molex PN35507-0200.

  (Current metering is available on AC rated devices only)

**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 and VDE 0805

**Impedance**
- See next page

**Isolation Resistance**
- Minimum of 100 Megohms @ 500VDC

**Overload**
- 50 operations @ 600% of rated current for AC rated devices

**Interrupt Capacity**
- See table A

### Environmental

**Operating Temperature**
- MIL-PRF-55629 and MIL-STD-202G
- -40°C to +85°C

**Vibration**
- MIL-PRF-55629 and MIL-STD-202G
- Method 213B, test condition “I”.
- Instantaneous and ultra short curves tested at 90% of rated current

**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)
- MIL-PRF-55629 and MIL-STD-202G,
- Method 106G, i.e., Ten 24-hour cycles at +25°C to +65°C, 80-98% RH

**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**
- MIL-PRF-55629 and MIL-STD-202G,
- Method 101, Condition A (90-95% RH @ 5% NaCl Solution, 96hrs)

### Physical

**Number of Poles**
- 1 - 2 poles

**Termination**
- Wire ready and touch proof wire clamp (See Figure 1). Accepts up to (2) #10 AWG wires per terminal. Designed for use with solid, stranded and flexible stranded wires, with or without ferrule or pin terminals. Also accepts straight fork and flanged fork terminals.

**Termination Torque**
- 15-20 in-lbs (Line & Load terminals)

**Termination Barrier**
- Integral sliding barrier to comply with spacing requirements
- (See figure 1)

**Mounting**
- Threaded Insert: #6-32 UNC-2B, or M3X0.5-6H B ISO

**Insert Termination Torque**
- 7-9 in-lbs

**Actuator**
- Rocker, with or without guard
- (See figures 1, 2, and 4)

**Internal Circuit Config.**
- Series Trip

**Materials**
- Housing - Glass Filled Polyester
- Rocker – Nylon
- Line/Load Terminals - Copper Alloy;
- Bright Acid Tin Plated

**Weight**
- ~107 grams (~3.76 ounces) per pole

**Standard Color**
- Housing – Black
- Rocker – Several

(See ordering scheme for colors)

### Agency Approvals
- UL489, cUL, TUV EN60947-2

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

## Table A: Voltage and Current Ratings

<table>
<thead>
<tr>
<th>VOLTAGE</th>
<th>CURRENT (AMPS)</th>
<th>NUMBER OF POLES</th>
<th>Interrupt Capacity (AMPS)</th>
<th>UL 489</th>
<th>EN60947-2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1-20 A</td>
<td>21-30 A</td>
<td></td>
</tr>
<tr>
<td>120/240 VAC</td>
<td>1 - 30</td>
<td>2</td>
<td>22000</td>
<td>5000</td>
<td>10000</td>
</tr>
<tr>
<td>240 VAC</td>
<td>1 - 20</td>
<td>1</td>
<td>10000</td>
<td>N/A</td>
<td>10000</td>
</tr>
<tr>
<td>277 VAC</td>
<td>1 - 20</td>
<td>1</td>
<td>10000</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Electrical: Impedance / Resistance**

### Resistance, Impedance Values

### N-Series Circuit Breaker – Ordering Scheme

**1 SERIES**
- N-Series Circuit Breaker

**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

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

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

**6 FREQUENCY & DELAY**
- 21: 50/60 Hz Ultra Short
- 22: 50/60 Hz Short
- 23: 50/60 Hz Medium
- 24: 50/60 Hz Long

**7 CURRENT RATING (AMPERES)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Amps</th>
<th>Code</th>
<th>Amps</th>
<th>Code</th>
<th>Amps</th>
</tr>
</thead>
<tbody>
<tr>
<td>410</td>
<td>1.00</td>
<td>440</td>
<td>4.00</td>
<td>490</td>
<td>9.00</td>
</tr>
<tr>
<td>512</td>
<td>1.25</td>
<td>445</td>
<td>4.50</td>
<td>495</td>
<td>9.50</td>
</tr>
<tr>
<td>415</td>
<td>1.50</td>
<td>450</td>
<td>5.00</td>
<td>610</td>
<td>10.00</td>
</tr>
<tr>
<td>517</td>
<td>1.75</td>
<td>455</td>
<td>5.50</td>
<td>710</td>
<td>10.50</td>
</tr>
<tr>
<td>420</td>
<td>2.00</td>
<td>460</td>
<td>6.00</td>
<td>611</td>
<td>11.00</td>
</tr>
<tr>
<td>522</td>
<td>2.25</td>
<td>465</td>
<td>6.50</td>
<td>711</td>
<td>11.50</td>
</tr>
<tr>
<td>425</td>
<td>2.50</td>
<td>470</td>
<td>7.00</td>
<td>612</td>
<td>12.00</td>
</tr>
<tr>
<td>527</td>
<td>2.75</td>
<td>475</td>
<td>7.50</td>
<td>712</td>
<td>12.50</td>
</tr>
<tr>
<td>430</td>
<td>3.00</td>
<td>480</td>
<td>8.00</td>
<td>613</td>
<td>13.00</td>
</tr>
<tr>
<td>435</td>
<td>3.50</td>
<td>485</td>
<td>8.50</td>
<td>614</td>
<td>14.00</td>
</tr>
</tbody>
</table>

**8 TERMINAL**
- 1 Screw Terminal

**9 ACTUATOR COLOR & LEGEND**

<table>
<thead>
<tr>
<th>Actuator Color</th>
<th>I-O</th>
<th>ON-OFF</th>
<th>Dual</th>
<th>Legend Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>A</td>
<td>B</td>
<td>1</td>
<td>Black</td>
</tr>
<tr>
<td>Black</td>
<td>C</td>
<td>D</td>
<td>2</td>
<td>White</td>
</tr>
<tr>
<td>Red</td>
<td>F</td>
<td>G</td>
<td>3</td>
<td>White</td>
</tr>
<tr>
<td>Green</td>
<td>H</td>
<td>J</td>
<td>4</td>
<td>White</td>
</tr>
<tr>
<td>Blue</td>
<td>K</td>
<td>L</td>
<td>5</td>
<td>White</td>
</tr>
<tr>
<td>Yellow</td>
<td>M</td>
<td>N</td>
<td>6</td>
<td>Black</td>
</tr>
<tr>
<td>Gray</td>
<td>P</td>
<td>Q</td>
<td>7</td>
<td>Black</td>
</tr>
<tr>
<td>Orange</td>
<td>R</td>
<td>S</td>
<td>8</td>
<td>Black</td>
</tr>
</tbody>
</table>

**10 MOUNTING**
- 1 6-32 x .195 inches Threaded Inserts
- 2 ISO M3 x 5 mm Threaded Inserts

**11 APPLICATION RATING**
- 1 120/240 VAC (2 Pole only)
- 2 240 VAC
- 3 277 VAC

**12 AGENCY APPROVAL**
- A Without Approvals
- G UL 489 Listed
- U TUV Certified, IEC 60947-2
- 3 UL 489 Listed, TUV Certified

Notes:
1. On multi pole units one current transformer is supplied on the actuator pole
2. Available up to 20 amps
3. Voltage rating F only available as a 1 pole device at 20 amps maximum
4. TUV approval requires dual (I-O, ON-OFF) markings
5. Approval Code “3” requires Dual (I-O, ON-OFF) markings on rocker.
6. +/-1% tolerance only available when used with +/-0.1% tolerance external burden resistor.
**Dimensional Specifications: in. [mm]**

**Figure 1. N-Series 1-Pole Construction**

**Notes:**
1. All dimensions are in inches [millimeters].
2. Tolerance ±0.020 [0.51] unless otherwise specified.
### Dimensional Specifications: in. [mm]

#### Figure 2. N-Series 2-Pole Construction

- **Max Width**: 1.500 [38.10]
- **RT 3/8-32 SCREW, TOUCH PROOF WIRE CLAMP TERMINAL**: 2.062 [52.33]
- **Terminal barsriers shown in open position**

#### N-Series 3-Pole Construction

- **Max Width**: 2.250 [57.15]

#### Figure 3. Panel Cutout Details

<table>
<thead>
<tr>
<th>Pole</th>
<th>Width</th>
<th>Height</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 POLE</td>
<td>0.75</td>
<td>1.73</td>
<td>0.175</td>
</tr>
<tr>
<td>2 POLE</td>
<td>0.75</td>
<td>1.38</td>
<td>0.175</td>
</tr>
<tr>
<td>3 POLE</td>
<td>0.75</td>
<td>1.38</td>
<td>0.175</td>
</tr>
</tbody>
</table>

**Notes:**
1. All dimensions are in inches [millimeters].
2. Tolerance ±0.020 [0.51] unless otherwise specified.
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About Carling

Founded in 1920, Carling Technologies is a leading manufacturer of electrical and electronic switches and assemblies, circuit breakers, electronic controls, power distribution units, and multiplexed power distribution systems. With four ISO9001 and IATF16949 registered manufacturing facilities and technical sales offices worldwide, Carling Technologies Sales, Service and Engineering teams do much more than manufacture electrical components, they engineer powerful solutions! To learn more about Carling please visit www.carlingtech.com/company-profile.

To view all of Carling’s environmental, quality, health & safety certifications please visit www.carlingtech.com/environmental-certifications
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