Junctions
Catalog data
**CA650104EN**

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COOPER POWER
SERIES

# 200 A and 600 A, 15 kV and 25 kV class variable junctions

Powering Business Worldwide

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# Multi-point variable junctions

## General

Eaton designs Cooper Power™ series junction bars for vault or apparatus applications and can be used for looping, tapping and sectionalizing. They are fully shielded, submersible, and are designed and manufactured in accordance with IEEE Std 386-2016 ™ standard – "Separable Insulated Connector Systems".

These junctions provide 2 to 6, 15 or 25 kV mixed inline 200 A loadbreak, 600 A deadbreak or 600 A loadbreak Cleer™ interfaces bussed together and encapsulated in a precision-molded, peroxide-cured EPDM insulated rubber body.

Junction bars come standard with a stainless steel mounting bracket.

Eaton Cooper Power series variable junctions provide endless opportunities to establish loops, taps, splices, and facilitate apparatus changeouts. Additionally, Eaton offers the only 600 A loadbreak interface in the industry, Cleer, bringing all of the advantages of 200 A junction bars into the 600 A world.

## Interchangeability

The IEEE Std 386-2016 ™ standard 200 A loadbreak and 600 A deadbreak interfaces are interchangeable with 200 A loadbreak and 600 A deadbreak terminations currently available from all other manufacturers that also comply with IEEE Std 386-2016 ™ standard.

## Installation

No special tools are required for installation. Junctions are bolted to the mounting surface.

200 A and 600 A connectors are assembled onto the junctions as described in the appropriate installation instructions for those connectors.

## Production tests

Tests conducted in accordance with IEEE Std 386-2016 ™:

- 200 A 15 kV Class
  - 1 minute AC 60 Hz withstand
    – 34 kV
  - Minimum partial discharge extinction voltage
    – 11 kV
- 200 A 25 kV Class
  - 1 minute AC 60 Hz withstand
    – 45 kV
  - Minimum partial discharge extinction voltage
    – 21.5 kV
- 600 A 25 kV Class
  - 1 minute AC 60 Hz withstand
    – 45 kV
  - Minimum partial discharge extinction voltage
    – 21.5 kV
- Cleer 15 kV Class
  - 1 minute AC 60 Hz withstand
    – 34 kV
  - Minimum partial discharge extinction voltage
    – 11 kV
- Cleer 25 kV Class
  - 1 minute AC 60 Hz withstand
    – 45 kV
  - Minimum partial discharge extinction voltage
    – 21.5 kV

Tests conducted in accordance with Eaton requirements:

- Physical inspection
- Physical dissection
- Periodic fluoroscopic analysis

## Table 1. Voltage ratings and characteristics

| Description | 200 A loadbreak kV ratings | | 600 A deadbreak kV ratings |
|---|---|---|---|
| Standard voltage class | 15 | 25 | 25 |
| Maximum rating phase to phase | 14.4 | 28 | 28 |
| Maximum rating phase to ground | 8.3 | 16.2 | 16.2 |
| ac 60 Hz 1 Minute withstand | 34 | 45 | 45 |
| dc 15 Minute withstand | 53 | 100 | 100 |
| BIL and full wave crest | 95 | 125 | 125 |
| Minimum partial discharge extinction voltage | 11 | 21.5 | 21.5 |

Voltage ratings and characteristics are in accordance with IEEE Std 386-2016™

## Table 2. Current rating and characteristics

| Voltage class | 200 A class product | | 600 A class deadbreak |
|---|---|---|---|
| Description | 15 kV | 25 kV | 25 kV |
| Continuous | 200 A rms | 200 A rms | 600 A rms |
| Switching | 10 operations at 200 A rms at 14.4 kV phase to phase | 10 operations at 200 A rms at 26.3 kV phase to phase | NA |
| Fault closure | 10,000 A rms symmetrical at 14.4 kV for 0.17 s after 10 switching operations phase to phase | 10,000 A rms symmetrical at 26.3 kV for 0.17 s after 10 switching operations phase to phase | NA |
| 4 Hour overload | | | 900 A rms |
| Short time | 10,000 A rms symmetrical for 0.17 s | 10,000 A rms symmetrical for 0.17 s | 25,000 A * rms symmetrical for 0.17 s |
| | 3,500 A rms symmetrical for 3.0 s | 3,500 A rms symmetrical for 3.0 s | 10,000 A rms symmetrical for 3.0 s |

Current ratings and characteristics are in accordance with IEEE Std 386-2016™

# Dimensional information

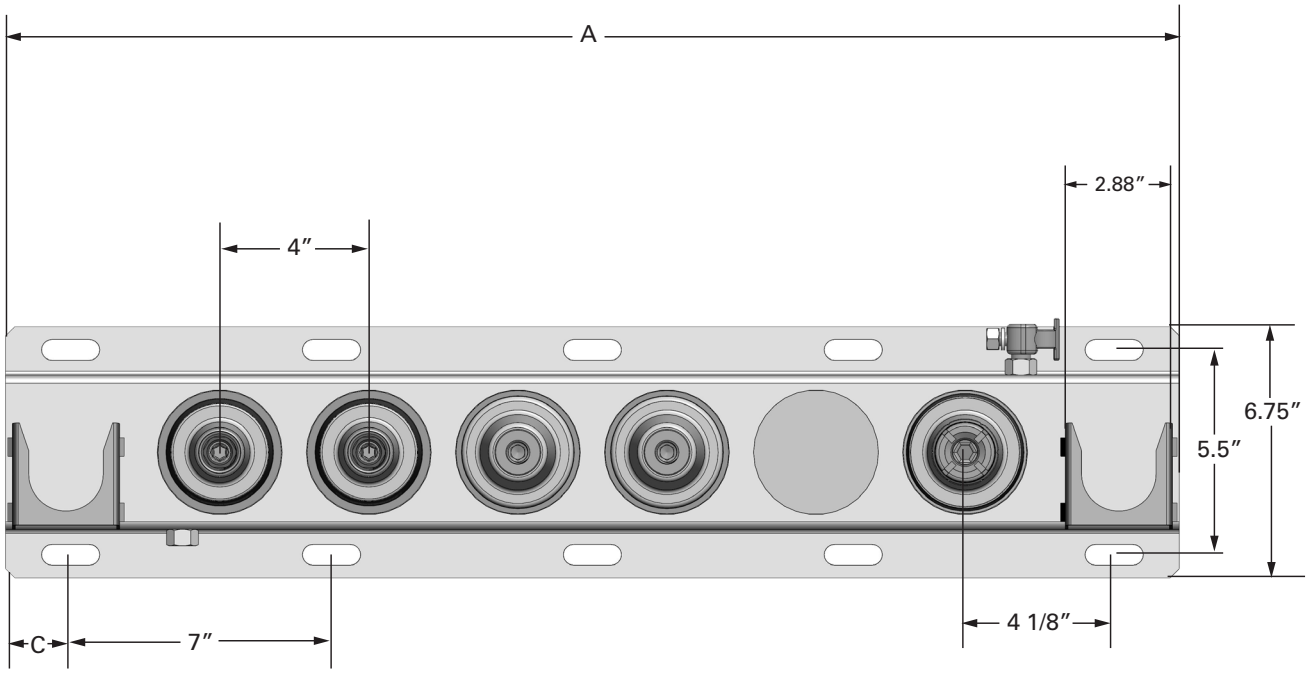



**Figure 1. Variable junction - top view.**

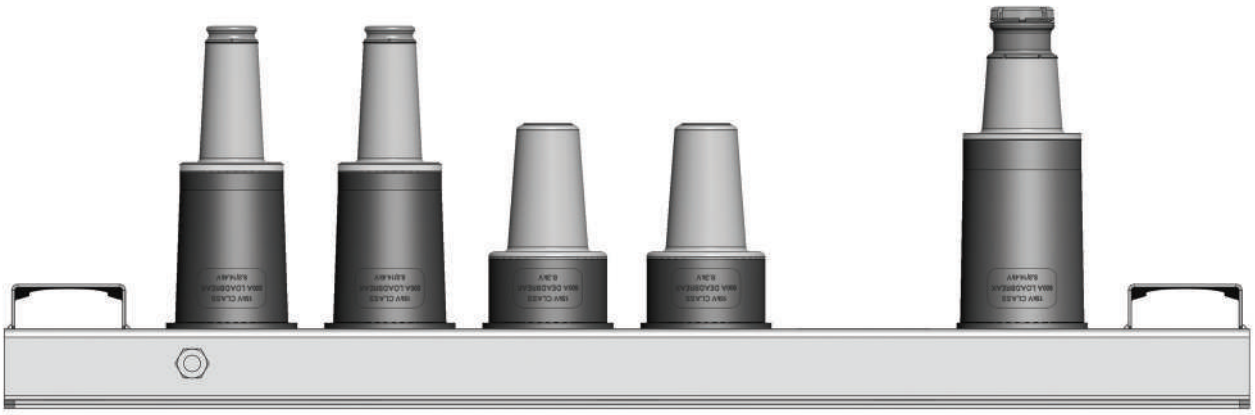


**Figure 2. Variable junction - front view.**

## Table 3. Length and width dimensions (dependent on interface count)

| Interfaces | Number of mounting holes per side | A (Overall junction length with parking stands) | A (Overall junction length without parking stands) | C Mounting Hole offset no parking stands (Bracket Start to slot center) | C Mounting Hole offset, 2 parking stands (Bracket start to slot center) |
|---|---|---|---|---|---|
| 2 | 2 | 15-1/2 | 9 | 1 | 4-1/4 |
| 3 | 3 | 19-1/2 | 13 | 3 | 2-3/4 |
| 4 | 4 | 23-1/2 | 17 | 1-1/2 | 1-1/4 |
| 5 | 4 | 27-1/2 | 21 | 3-1/2 | 3-1/4 |
| 6 | 5 | 31-1/2 | 25 | 2 | 1-3/4 |

All dimensions are in inches.

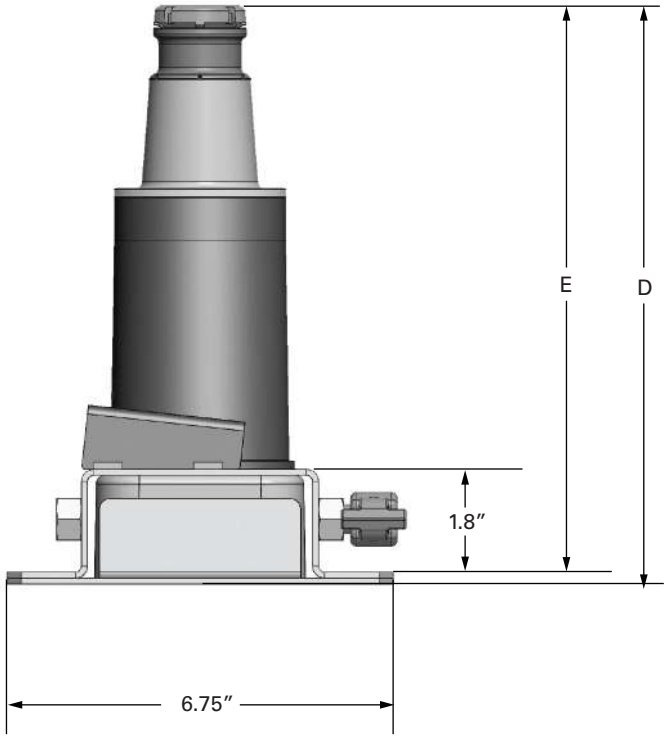



**Figure 3. Variable junction - side view.**

**Table 4. Height dimensions** (dependent on interface type)

| kV | Interface | D (Height - bottom of bracket to top of interface) | E (Height - bottom of junction to top of interface) |
|---|---|---|---|
| 15 | 200 A | 9-3/4 | 9-5/8 |
| 25 | 200 A | 10-1/4 | 10-1/8 |
| 15/25 | 600 A | 7-1/4 | 7-1/8 |

All dimensions are in inches.

All interfaces are 4.0" center to center.

Parking stand center to interface center is 4.125"

All mounting slots are 0.563" x 1.563"

# Ordering Information

To order a variable junction reference Figure 4 for catalog number configuration.

Each kit contains:

- Molded rubber variable junction
- Bracket (Stainless steel bracket with ground nut)
- Shipping caps
- Installation instruction sheet

The number of interfaces in character 5 will specify the number of digits in the interface configuration field. The interface configuration field will read left to right across the junction.

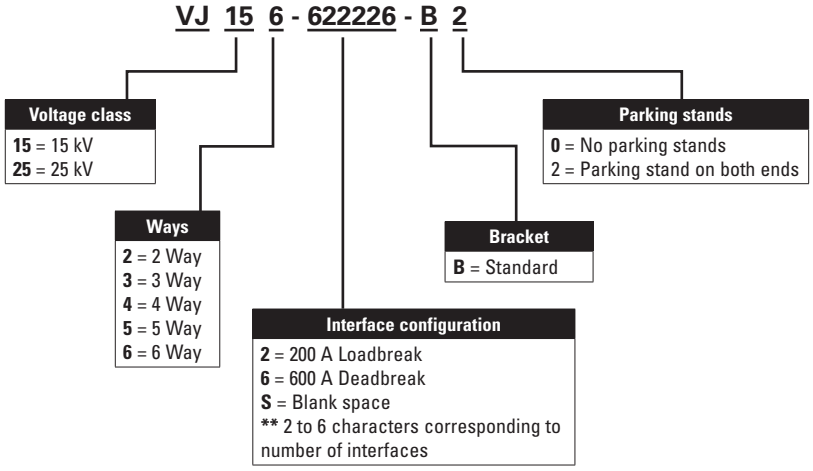



**Figure 4. Catalog number configurator.**

**Example:**

- Sectionalizing cabinet, 25 kV, 4 positions with 600 A in position 1, 200 A interface in positions 2, 3 and 4. Catalog number would be VJ254-6222-B0.

For further installation information reference "MN650065EN - 200 A and 600 A variable junction 15 kV and 25 kV class installation and operation instructions"

# Cleer multi-point junction assemblies

## General

Eaton designs Cooper Power series Cleer junction assemblies for vault or apparatus applications, which can be used for looping, tapping, switching and sectionalizing. They are fully shielded, submersible and are designed and manufactured in accordance with the IEEE Std 386-2016 standard – "Separable Insulated Connector Systems."

These junctions provide assemblies of multiple 2 to 6 mixed interface, 15 kV or 25 kV junctions linked by the Cleer C-connector to create unique opportunities to establish 600 A loadbreak switching capabilities in underground circuits.

Each individual junction in the assembly is bussed together and encapsulated in a precision-molded, peroxide-cured EPDM insulated rubber body. The Cleer C-connector is used to jumper junction-to-junction, and create a 600 A Loadbreak-rated current path. Each assembly is provided pre-installed in a stainless-steel bracket which guarantees a solid foundation for operations of the C-connector.

With the incorporation of Cleer interfaces and C-connectors to the multi-point junction portfolio, Eaton provides simple, compact and retrofittable solutions for 600 A loadbreak sectionalizing points, 200 A and 600 A bypass switches and the ability to mimic some common switchgear lineups with the aid of fused elbows or other external fusing.

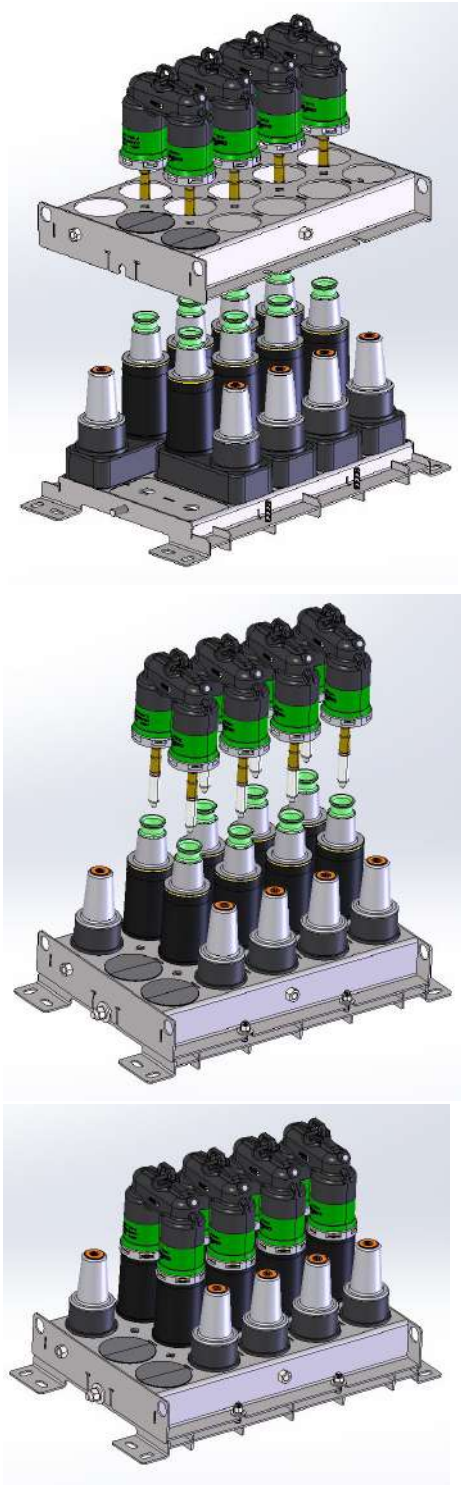


**Figure 5. Exploded view of Cleer multi-point junction assembly demonstrating use of multiple junction buss, bracket and C-connectors to a make full switching assembly.**

## Table 5. Voltage ratings and characteristics

| Description | 200 A loadbreak kV ratings | | 600 A deadbreak kV ratings | 600 A Cleer loadbreak kV ratings | |
|---|---|---|---|---|---|
| Standard voltage class | 15 | 25 | 25 | 15 | 25 |
| Maximum rating phase to phase | 14.4 | 28 | 28 | 14.4 | 28 |
| Maximum rating phase to ground | 8.3 | 16.2 | 16.2 | 8.3 | 16.2 |
| ac 60 Hz 1 Minute withstand | 34 | 45 | 45 | 34 | 45 |
| dc 15 Minute withstand | 53 | 100 | 100 | 53 | 100 |
| BIL and full wave crest | 95 | 125 | 125 | 95 | 125 |
| Minimum partial discharge extinction voltage | 11 | 21.5 | 21.5 | 11 | 21.5 |

Voltage ratings and characteristics are in accordance with IEEE Std 386-2016™

## Table 6. Current rating and characteristics

| Voltage class | 200 A class product | | 600 A class deadbreak | 600 A class Cleer loadbreak | |
|---|---|---|---|---|---|
| Description | 15 kV | 25 kV | 25 kV | 15 kV | 25 kV |
| Continuous | 200 A rms | 200 A rms | 600 A rms | 600 A rms | 600 A rms |
| Switching | 10 operations at 200 A rms at 14.4 kV phase to phase | 10 operations at 200 A rms at 26.3 kV phase to phase | NA | 10 operations at 600 A at 14.4 kV phase to phase | 5 operations at 600 A at 26.3 kV phase to phase |
| Fault closure | 10,000 A rms symmetrical at 14.4 kV for 0.17 s after 10 switching operations phase to phase | 10,000 A rms symmetrical at 26.3 kV for 0.17 s after 10 switching operations phase to phase | NA | 16,000 A rms symmetrical at 14.4 kV after ten 600 A operations for 0.17 s phase to phase | 10,000 A rms symmetrical at 26.3 kV after five 600 A operations for 0.17 s phase to phase |
| 4 Hour overload | | | 900 A rms | 900 A rms | 900 A rms |
| Short time | 10,000 A rms symmetrical for 0.17 s | 10,000 A rms symmetrical for 0.17 s | 25,000 A * rms symmetrical for 0.17 s | 25,000 A * rms symmetrical for 0.17 s | 25,000 A * rms symmetrical for 0.17 s |
| | 3,500 A rms symmetrical for 3.0 s | 3,500 A rms symmetrical for 3.0 s | 10,000 A rms symmetrical for 3.0 s | 10,000 A rms symmetrical for 3.0 s | 10,000 A rms symmetrical for 3.0 s |

Current ratings and characteristics are in accordance with IEEE Std 386-2016™

* 600 A loadbreak connectors are generally capable of short-time current ratings well in excess of those listed (25 kA to 40 kA ratings for 0.17s are typical). However, ratings are limited in the current rating table by the fault-closure rating. Contact your Eaton representative for maximum short-time current ratings if fault-closure operations are infeasible in your application.

## Dimensional information

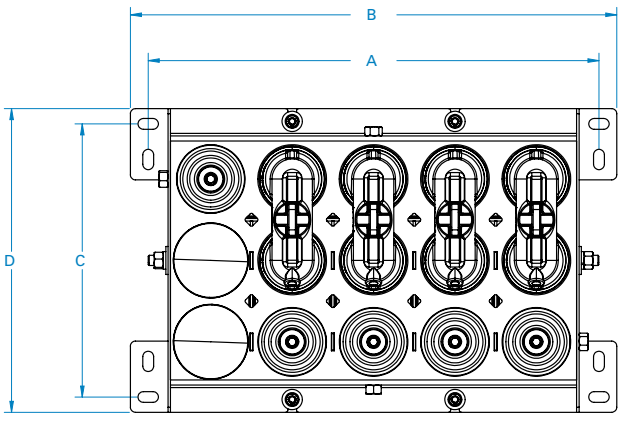



**Figure 7. Cleer multi-point junction assembly - top view.**

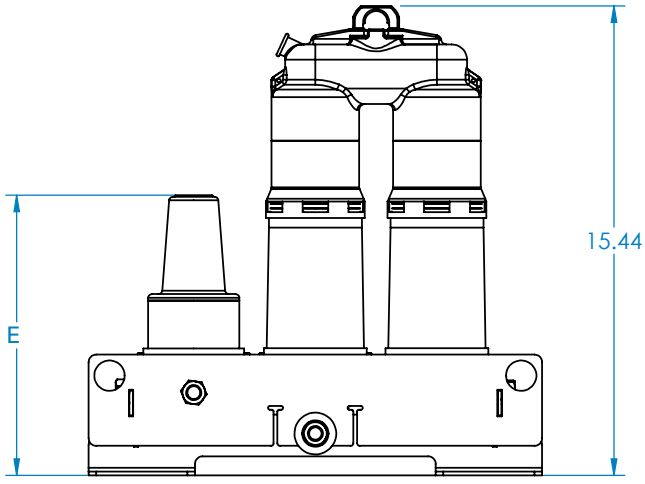



**Figure 8. Cleer multi-point variable junction assembly - side view.**

### Table 7. Interfaces across

| | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| **A** | 10.15 | 14.15 | 18.15 | 22.15 | 26.15 |
| **B** | 11.90 | 15.90 | 19.90 | 23.90 | 27.90 |

All dimensions are in inches.

### Table 8. Interfaces tall

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| **C** | 5.42 | 9.42 | 13.42 | 17.42 |
| **D** | 6.92 | 10.92 | 14.92 | 18.92 |

All dimensions are in inches.

### Table 9. Interface height

| | E |
|---|---|
| **200 A 15 kV loadbreak** | 11.67 |
| **200 A 25 kV loadbreak** | 11.68 |
| **600 A 15/25 kV deadbreak** | 9.21 |
| **600 A 15 kV loadbreak, Cleer** | 15.44 |
| **600 A 25 kV loadbreak, Cleer** | 15.44 |

All dimensions are in inches.

# Ordering Information

To order a Cleer variable junction assembly, reference Figure 9 for catalog number configuration.

Each kit contains:

- Molded rubber Cleer multi-point junctions
- Bracket (stainless-steel bracket with ground nuts)
- C-connectors to complete circuit path
- Shipping caps
- Installation instruction sheet

Kits do not contain Cleer protective caps or other Cleer accessories used during operations. Please reference standard Cleer catalogs for accessories such as protective caps, standoff bushings and grounding elbows.

- 15 kV Cleer catalog – CA650010EN
- 25 kV Cleer catalog – CA650011EN
- Cleer grounding elbow – CA650013EN

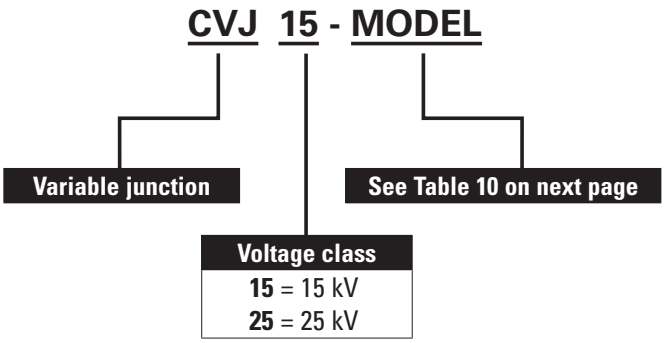
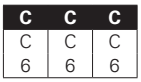
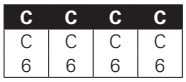
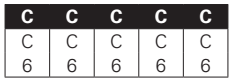
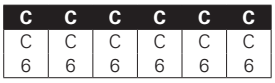
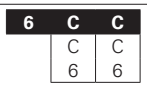
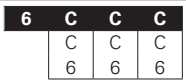
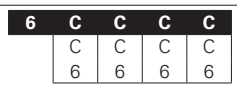
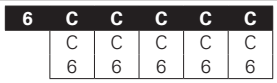
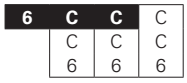
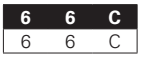


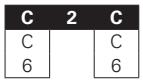
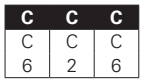
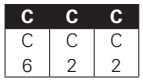
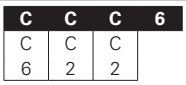
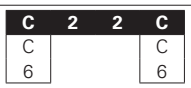
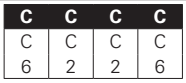
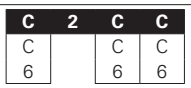
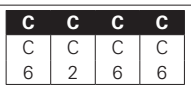
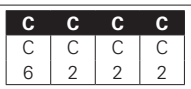

**Figure 9 . Cleer variable junction catalog number configurator.**

Each individual block in the configuration diagrams below represents an individual junction. Junctions are jumpered together using Cleer C-connectors to connect two Cleer bushings. Cleer interfaces are represented by the letter "C", 600 A deadbreak interfaces are represented by the number "6" and 200 A loadbreak interfaces are represented by the number "2".

Example: A solution is needed to bypass a 25 kV 3-in-1 padmount regulator that is rated at less than 200 A. User could specify using one unit of CVJ25-200BP per phase or 3 pieces total.

## Table 10. Cleer variable junction configuration models

| Configuration | Description | Model |
|---|---|---|
|  | 3 way 600 A loadbreak junction | 3WLB |
|  | 4 way 600 A loadbreak junction | 4WLB |
|  | 5 way 600 A loadbreak junction | 5WLB |
|  | 6 way 600 A loadbreak junction | 6WLB |
|  | 2 way 600 A loadbreak switch | 2WSW |
|  | 3 way 600 A loadbreak switch | 3WSW |
|  | 4 way 600 A loadbreak switch | 4WSW |
|  | 5 way 600 A loadbreak switch | 5WSW |
|  | 200 A bypass switch | 200BP |
|  | 600 A bypass switch inline configuration | 600BPIL |
|  | 600 A bypass switch - stacked configuration | 600BPST |
|  | Parallel cable sectionalizing point - stacked | PCSPST |
|  | Parallel cable sectionalizing point - inline | PCSPIL |
|  | 200 A switch | 200SW |

| Configuration | Description | Model |
|---|---|---|
|  | Model 6 | M6 |
|  | Model 6B | M6B |
|  | Model 7 | M7 |
|  | Model 7B | M7B |
|  | Model 8 | M8 |
|  | Model 8B | M8B |
|  | Model 9 | M9 |
|  | Model 9B | M9B |
|  | Model 10T | M10T |
|  | Model 11 | M11 |
|  | Model 11B | M11B |
|  | Model 12 | M12 |
|  | Model 12B | M12B |

As previously stated, this catalog does not cover all available configurations. Customers are encouraged to use Cleer variable junctions as building blocks to solve problems in their grids. Contact your Eaton representative for more assistance in developing solutions for unique applications.

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