Medium Voltage Switchgear Technical Summary

# Switchgear Ratings and Specifications

This document provides a general technical overview for typical medium-voltage switchgear assemblies used in indoor and outdoor installations, designed in alignment with ANSI and IEEE standards. All data and visual materials are for general engineering reference only and may be adapted for client-specific publications or technical reviews.

## 1. Switchgear Typical Specifications

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| Specification | NEMA 1 (Indoor) | NEMA 3R (Outdoor) |
| Application | Indoor Medium Voltage Distribution | Outdoor Medium Voltage Distribution |
| Enclosure Type | NEMA 1 (Indoor, Non-Gasketed) | NEMA 3R (Outdoor, Weatherproof) |
| Rated Voltage | Up to 38 kV | Up to 38 kV |
| Rated Current (Main Bus) | Up to 4000 A | Up to 3000 A |
| Short Circuit Rating (kAIC) | Up to 63 kA | Up to 40 kA |
| Basic Insulation Level (BIL) | 95 kV | 150 KV (optional 170KV) |
| Power Frequency Withstand | 36 kV | 60 kV |
| Operating Frequency | 60 Hz | 60 Hz |
| Ambient Temperature Range | -20°C to +40°C | -30°C to +40°C |
| Altitude Rating | Up to 1000 meters without derating | Up to 1000 meters without derating |
| Compliance Standards | ANSI C37.20.2, IEEE C37.04, C37.013A | ANSI C37.20.2, IEEE C37.04, C37.013a |

## 2. BIL Ratings by Voltage Level

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| Rated Voltage (kV) | BIL (kV) |
| 2.8 kV | 60 kV |
| 5 kV | 60 kV |
| 15 kV | 95 kV |
| 27 kV | 125 kV |
| 38 kV | 150 kV (170KV optional) |

## 3. Equipment Derating Curves

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| \***Altitude** **Derating Curve** — **Load Current Capacity\*** - Equipment current and insulation capability may reduce at elevations above 1000 meters due to lower air density. - Derating factors:  - 0 meters: 1.00  - 500 meters: 0.98  - 1000 meters: 0.96  - 1500 meters: 0.94  - 2000 meters: 0.92  - 2500 meters: 0.90  - 3000 meters: 0.88  - 3500 meters: 0.86  - 4000 meters: 0.84 | \***Temperature Derating Curve — Load Current Capacity** (in degrees Fahrenheit)\* - Higher ambient temperatures reduce the current-carrying capacity of conductors and busbars. - Derating factors:  - -4°F: 1.02  - 14°F: 1.01  - 32°F: 1.00  - 50°F: 0.99  - 68°F: 0.97  - 86°F: 0.95  - 104°F: 0.92  - 122°F: 0.88  - 140°F: 0.85 |

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| \***BIL Derating Curve by Altitude** — Impulse Withstand Capability\* - Impulse withstand ratings (BIL) may decrease at high altitudes due to reduced air insulation strength. - Example derating factors:  - 0 meters: 1.00  - 1000 meters: 0.98  - 2000 meters: 0.94  - 3000 meters: 0.90  - 4000 meters: 0.86 | \***BIL Derating Curve by Temperature** — Impulse Withstand Capability (°F)\* - Elevated temperatures can degrade dielectric properties, reducing BIL effectiveness. - Example derating factors:  - -4°F: 1.02  - 32°F: 1.00  - 68°F: 0.97  - 104°F: 0.93  - 140°F: 0.87 |

## Sources and Legal Notice

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\*\*Prepared for: Switchgear Resources, inc.\*\*

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