ReliaGear® ND
ANSI narrow frame metal-clad switchgear
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ReliaGear® ND Introduction

ReliaGear® ND is a new IEEE C37.20.2-1999 compliant, 5 and 15 kV metal-clad switchgear platform featuring a narrow width, two-high breaker configurations and the compact, easy to maintain Vmax/A Breaker. Measuring in at 26 inches wide, 98 inches tall and 77 inches deep one-high or 85 inches two-high, ReliaGear ND is a compact solution for new installation space savings or meeting existing installation space constraints. Utilizing the ABB Vmax/A breaker, maintenance and repair costs are greatly reduced due to its modular design and quick change trip and close coil and charge motor design.

Product highlights
ReliaGear ND’s compact, space saving design efficiently uses space while still providing the following benefits:
- Reduced 26-inch frame width for both 5 kV and 15 kV switchgear
- Minimal depth of 77 inches for one-high and 85 inches for two-high construction for 5 and 15 kV
- Modular design and construction
- Low voltage instrumentation mounting space available on breaker doors to efficiently use mounting locations even with a small footprint
- Options for surge arresters, zero sequence CTs
- Available for top and/or bottom cable and bus duct entry
- Reduced shipping splits due to decreased frame weight and size
- Viewing window for verification of breaker/PT/CPT truck and position
- UL certified

Delrin arc-quenching contacts
For PT and CPT contacts, ABB uses Delrin arc-quenching contacts. A sleeve, with a round conductor probe, is inserted into a receptacle with recessed contacts. Due to the unique properties of Delrin, which include self-lubrication, arcs created during load break conditions are extinguished by a gas emitted by the Delrin material as it heats instead of drawing the arc outside of the contact boundary as they separate. The recessed contact design blocks access to the live bus, thereby eliminating the need for shutters in PT and CPT compartments.

Galvanized steel construction
ReliaGear ND is built using galvanized steel construction for increased protection from rust, scratches, and corrosion. Galvanized steel is used inside low voltage compartments for its increased illumination properties to provide for better instrument viewing.

ReliaGear ND accessories
- Breaker lift truck
- Mechanically operated Ground & Test Device
- Test cabinet
- Test jumper
- Primary and secondary potential transformer fuses
- SmartRack™ remote racking device
- REA arc protection relay system

Ratings of ReliaGear ND

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Unit</th>
<th>Rated maximum voltage level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>5 kV</td>
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<tr>
<td>Rated nominal voltages</td>
<td>kV</td>
<td>2.4, 4.16, 4.8</td>
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<tr>
<td>Main bus continuous current</td>
<td>A</td>
<td>1200, 2000</td>
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<tr>
<td>Short circuit current (rms)</td>
<td>kA</td>
<td>25, 31.5</td>
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<tr>
<td>Rated frequency</td>
<td>Hz</td>
<td>50, 60</td>
</tr>
<tr>
<td>Low frequency withstand (rms)</td>
<td>kV</td>
<td>19</td>
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<tr>
<td>Impulse level (BL, crest)</td>
<td>kV</td>
<td>60</td>
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<tr>
<td></td>
<td></td>
<td>15 kV</td>
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<tr>
<td></td>
<td></td>
<td>6.9, 7.2, 8.4, 11, 12, 12.47, 13.2,</td>
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<td></td>
<td></td>
<td>13.8, 14.4</td>
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<tr>
<td></td>
<td></td>
<td>1200, 2000</td>
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<td></td>
<td></td>
<td>25, 31.5</td>
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<td>50, 60</td>
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<td></td>
<td>60</td>
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<tr>
<td></td>
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<td>36</td>
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</tbody>
</table>

* Ratings given are for service conditions within temperature and altitude limitations as defined by IEEE C37.20.2-1999 metal-clad standard.
Compliant with IEEE C37.04, C37.06, and C37.09, the Vmax/A is a reliable, lightweight, and flexible breaker used in the ReliaGear ND platform. The Vmax/A breaker features a modular, easy to maintain design with only a single screw to remove the smart coil assembly and spring charged motor. Using this design, maintenance time on breakers is greatly reduced - lowering maintenance costs and limiting employee exposure to the switchgear, increasing personnel safety.

The Vmax/A breaker’s lightweight design, with optional roll-on-the-floor wheels, provides direct roll-in access to lower breaker cubicles without the use of a lift truck for convenient removal and insertion of breaker elements.

### Vmax/A breaker ratings

<table>
<thead>
<tr>
<th>Voltage (kV)</th>
<th>Main bus</th>
<th>Isc (kA)</th>
<th>Interrupt</th>
<th>Close &amp; latch</th>
<th>BiL</th>
<th>Low frequency withstand</th>
<th>Interrupt time</th>
<th>No load mech endurance</th>
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<tr>
<td>5</td>
<td>1200</td>
<td>25</td>
<td>25</td>
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<td>19</td>
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<td>31.5</td>
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<td>3</td>
<td>10000</td>
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</tbody>
</table>
Instrument transformers
Current transformers

ReliaGear ND is designed and tested for use with the ABB SCH-3U current transformers. These CTs are used for voltage ratings of 5 and 15 kV. Each breaker can accommodate up to two load side and one bus side CT for a total possible three current transformers per phase.

The SCH-3U current transformers are available in single- and multi-ratio styles with primary ampere ratings from 50-2000 A. These current transformers are used as a source of current for both relaying and metering.

The ring-type core is insulated and toroidally wound with a fully distributed secondary winding. The protective case, made of an impact-resistant polycarbonate, is assembled using self-tapping screws. Secondary terminals are 10-32 brass terminal screws with hardware.

These units meet all applicable IEEE and NEMA standards and are UL Recognized components.

**Product features**
- 600 V indoor
- 10 kV BIL
- 60 Hz
- 50-2000 A primary amperes
- Mechanical rating: 180 x normal
Potential transformers

15 kV potential transformers
For 15 kV applications, ReliaGear ND is designed and tested for use with ABB VIZ-75, VIZ-11, and TJC5 indoor potential transformers (PT). All PTs are fused and can be used for metering and relaying applications. PTs are mounted on draw-out trays that are available in both single-phase and three-phase configurations including wye-wye, open delta, line-line, and line-ground connections.

ABB VIZ primary and secondary coils are wound using special winding and shielding techniques for improved voltage stress distribution. The coils are designed to withstand continuous operation at either 1.1 or 1.25 times the line-to-line voltage level for Z burden units, and 1.9 times the line-to-ground voltage level for Y burden units.

Each coil is insulated with Mylar film to provide a high dielectric strength between layers. The coils and core are combined to create a complete winding structure that is assembled to a support frame. The entire assembly is vacuum-cast in polyurethane for added insulation and protection.

These units meet all applicable IEEE and NEMA standards and are UL Recognized components.

5 kV potential transformers
For 5 kV applications, ReliaGear ND is designed and tested for use with the ABB VIY-60 indoor potential transformers.

The VIY-60 indoor potential transformers are fused and are used for metering or relaying applications.

ReliaGear ND utilizes drawout trays for the PTs that offer closed door push/pull operation for increased safety. These trays are available in both single-phase and three-phase PT applications, and include both wye-wye and open delta configurations.

The primary and secondary coils are wound using special winding and shielding techniques for improved voltage stress distribution. The coils are designed to withstand continuous operation at 1.1 times the line-to-line voltage level and the line-to-ground voltage level for Y burden units.

Each coil is insulated with Mylar film to provide a high dielectric strength between layers. The coils and core are combined to create a complete winding structure that is assembled to a support frame. The entire assembly is vacuum-cast in polyurethane for added insulation and protection.

These units meet all applicable IEEE and NEMA standards and are UL Recognized components.
Distribution protection and control
Relion® relays

ABB’s Relion® family of protection and control relays for distribution applications provides the performance, safety, and ease-of-use that switchgear specifiers and users demand. The Relion 615 and 620 series offer complete protection and control for feeders, motors, and transformers in switchgear applications and are characterized by their flexibility and performance in today’s and future distribution schemes.

The IEC61850 implementation in Relion includes fast peer-to-peer communication over the substation bus. GOOSE communication is used between Relion devices in switchgear to form a stable, reliable, and high-speed bus bar protection system, provide fast and dependable auto transfer schemes and zone interlocking. Separate hard-wiring is not needed for the horizontal communication between the switchgear cubicles.

Relion relays for feeder protection offer an optional cable fault detection function that can detect extremely short duration underground faults. These faults are typically undetectable by conventional protection where there is no operation of the breaker. This feature helps users to learn of these events faster, resulting in reduced down time.

ABB’s COM600 Grid Automation Controller can be used as a local HMI to display switchgear single line diagrams and the status of devices such as breakers and protection relays. COM600 also provides gateway functionality to enable switchgear integration into SCADA systems. It can be easily installed as part of the switchgear control devices.

Relion 615R, 615 and 620 series relays include:
- Comprehensive set of protection and metering functions for feeders, transformers, and motors
- Draw-out design
- Integrated open/close push buttons and local/remote selector with indicating lights
- Protection and control for one and two breakers, as well as breaker-and-a-half schemes
- Enhanced safety with optional arc fault protection in all 615 and 620 series relays
- Web browser based user interface accessible through an RJ45 front port
- Trip coil monitoring
- Monitoring of breaker health parameters such as travel time, number of operations, wear and tear, and spring charging time
- DNP3 and Modbus protocols included standard in all relays
- Relion relays are fully IEC61850 compliant for communication and interoperability of substation automation devices
- Fully ANSI and RoHS compliant, as well as UL listed

Relion 615 series Relion 620 series COM600 Grid Automation Controller
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