ReliaGear® ND
ANSI narrow design metal-clad switchgear

Agenda

- Overview
- Ratings, certifications and construction
  - Breaker compartments and operation
  - PT/CPT compartments and operation
  - Instrument transformers
  - Configurations
- Vmax/A breaker
- Values
- Questions

ReliaGear® ND
Ratings, standards and certifications, and construction

- Metal-clad switchgear per IEEE C37.20.2-1999
  - UL label available
- Narrow frame at 26” wide
- Utilizes the Vmax/A breaker

Voltage (kV)	Main bus	Isc (kA)	Interruption	Close & latch	BIL	Low frequency withstand
		25	25	65	60	19
	1200	31.5	31.5	82	60	19
		25	25	65	60	19
5	2000	31.5	31.5	82	60	19
		25	25	95	95	36
	1200	31.5	31.5	82	95	36
		25	25	65	95	36
15	2000	31.5	31.5	82	95	36

ReliaGear® ND Construction

- Metal-clad construction using galvanized steel
- Modular compartments
- Available compartment types:
  - Breaker
  - Low-voltage
  - PT
  - CPT
  - Bus and Cable
- Dimensions:
  - One-high: 26x104x77”
  - Two-high: 26x104x85”

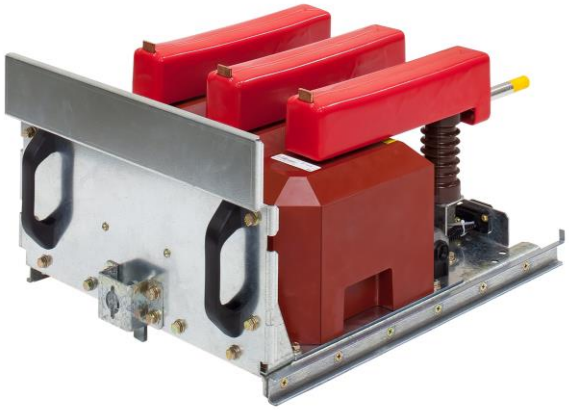
ReliaGear® ND
Breaker compartment

- Epoxy breaker primary bushings
- Three breaker statuses
  - Disconnect: primary and secondary disconnected
  - Test: primary disconnected and secondary plug connected
  - Connected: primary and secondary connected.
- Breaker interlocks per IEEE C37.20.2-1999

ReliaGear® ND
Breaker interlocks

- Breaker is in “disconnect” position when inserted and latched into the cubicle.
- The secondary plug is a self-aligning, rating encoded, quick disconnect secondary umbilical type plug.
- The breaker is blocked from racking until secondary umbilical plug is fully engaged.
- Breaker is in “test” position when the secondary disconnect is fully engaged.
- Breaker can be racked into “connected” position by inserting and rotating racking handle.
- Once racking begins, secondary umbilical plug is held captive and cannot be removed.

ReliaGear® ND
PT and CPT compartments



- PT compartment uses a push-pull design with handle
- Configurations available:
  - Wye-wye
  - Open-delta
  - Line-line
  - Line-ground
- Delrin arc-snuffing technology

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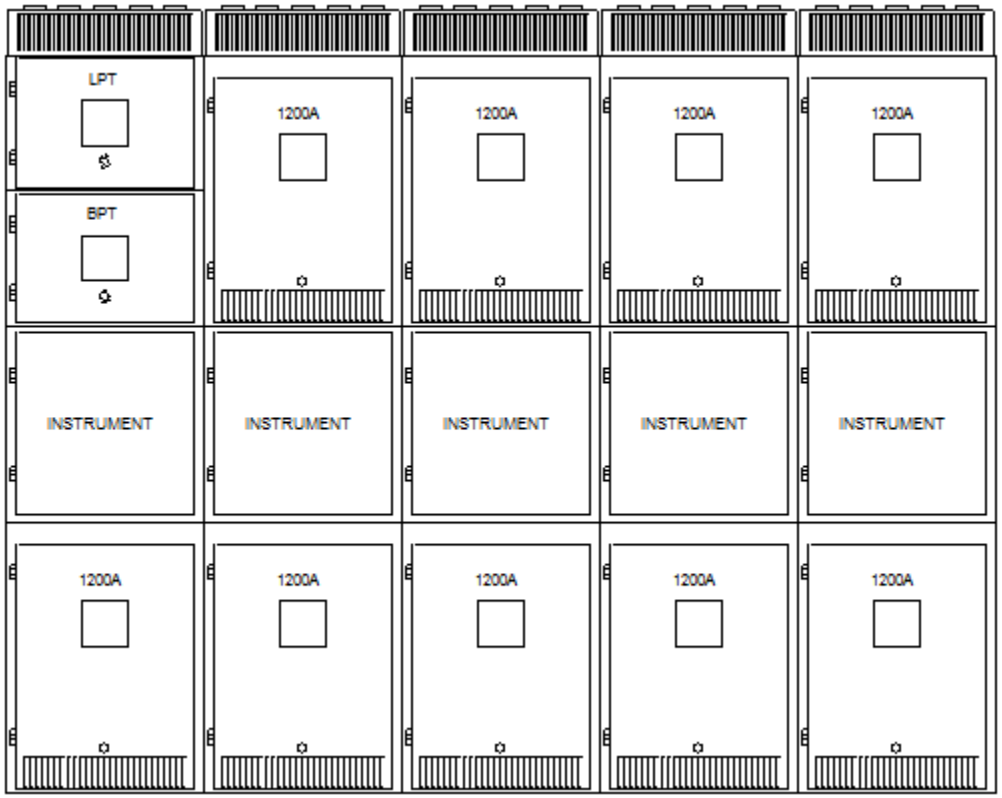
Instrument transformers

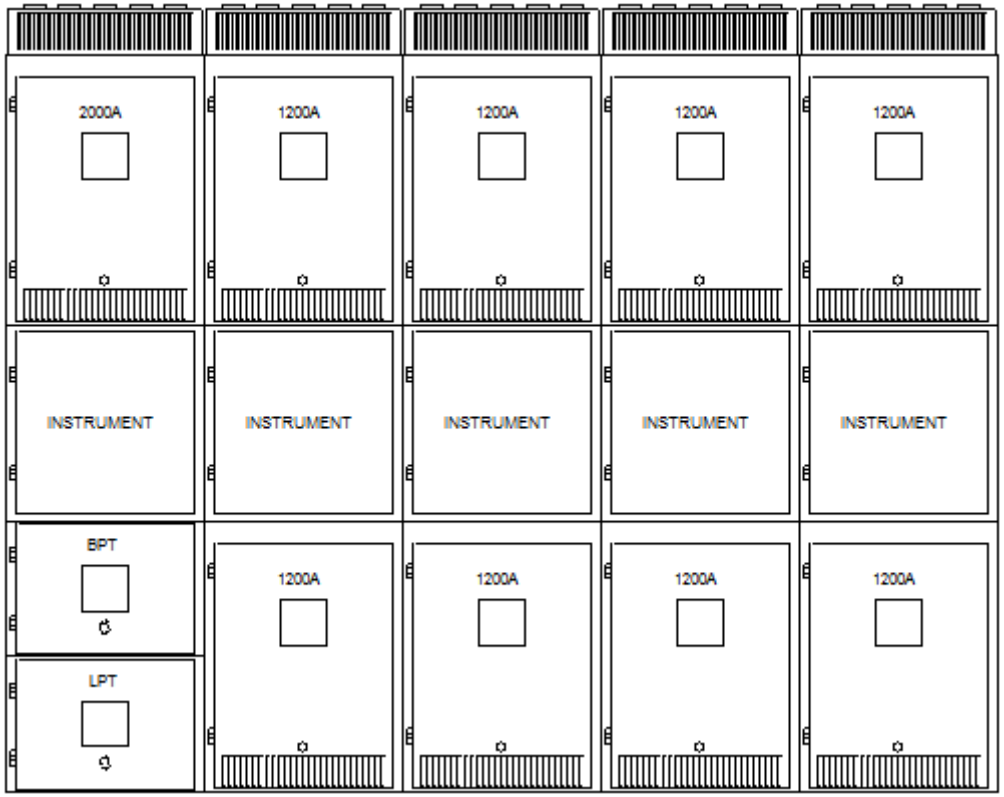
- CTs: SCH-3U
- PTs:
  - VIZ-60
  - TJC5
  - VIZ-75-11

  CPT: CPT-IK
- Ground sensor CTs:
  - BYZ-S
  - BYZ-O

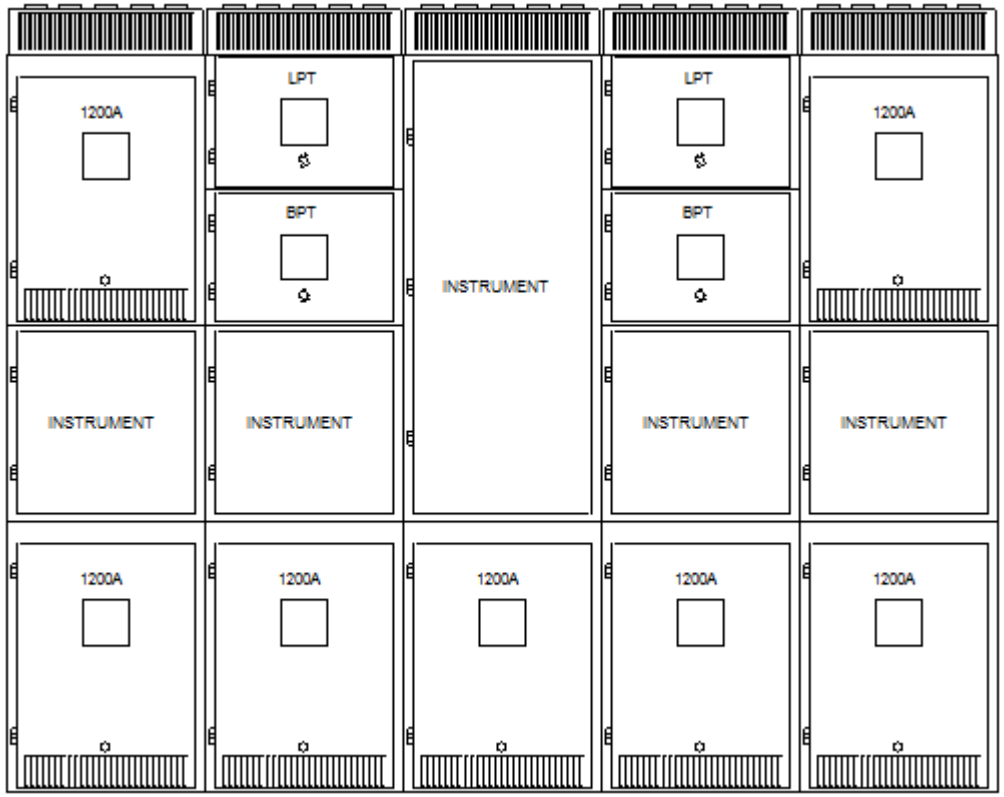
ReliaGear® ND
Configurations – main with feeder breakers 1200 A



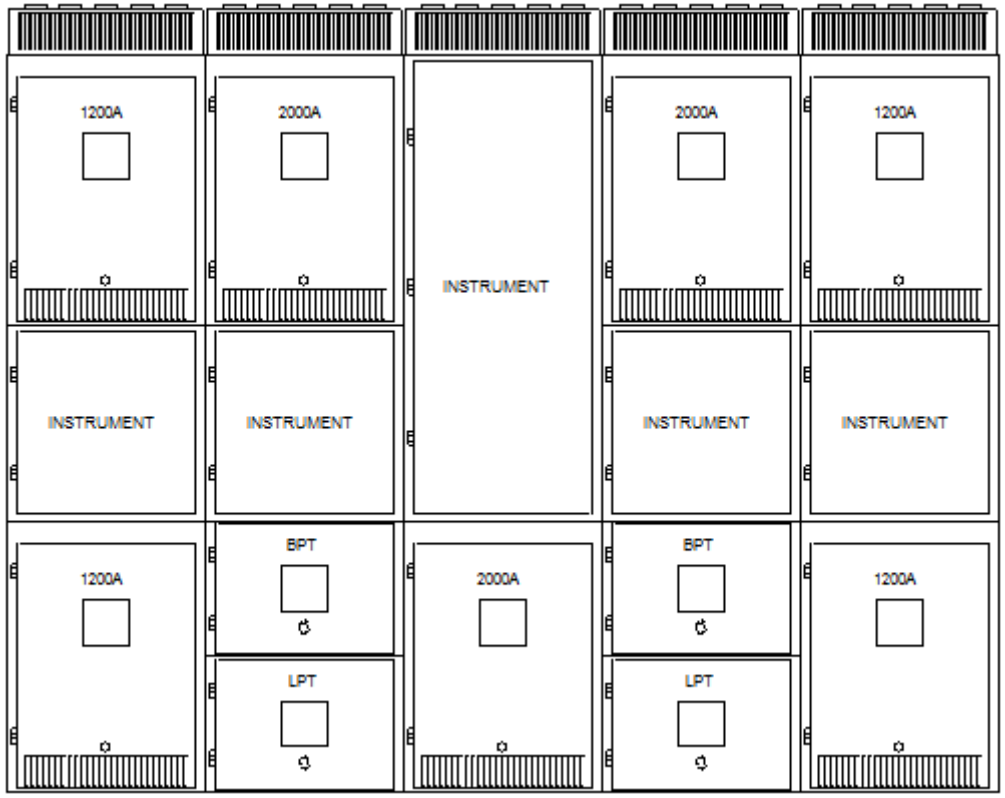
ReliaGear® ND
Configurations – main with feeder breakers 2000 A



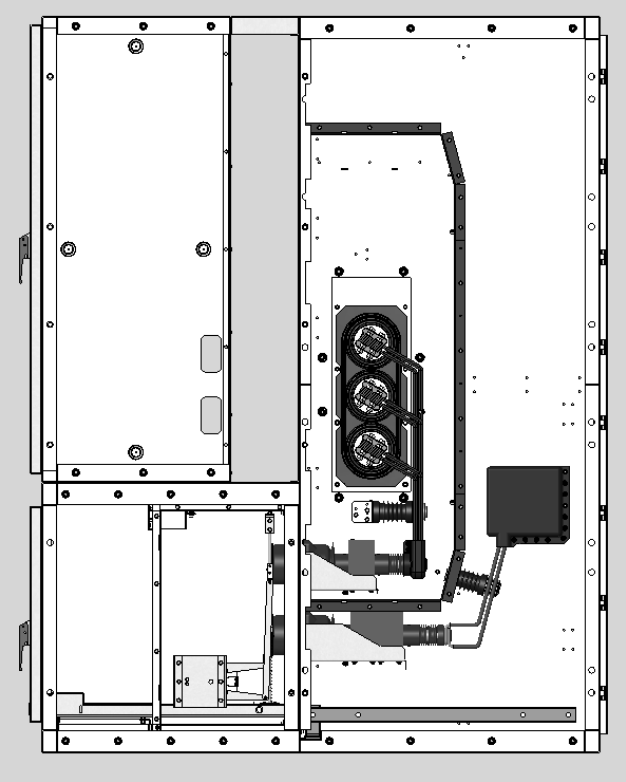
ReliaGear® ND
Configurations – MTM 1200 A



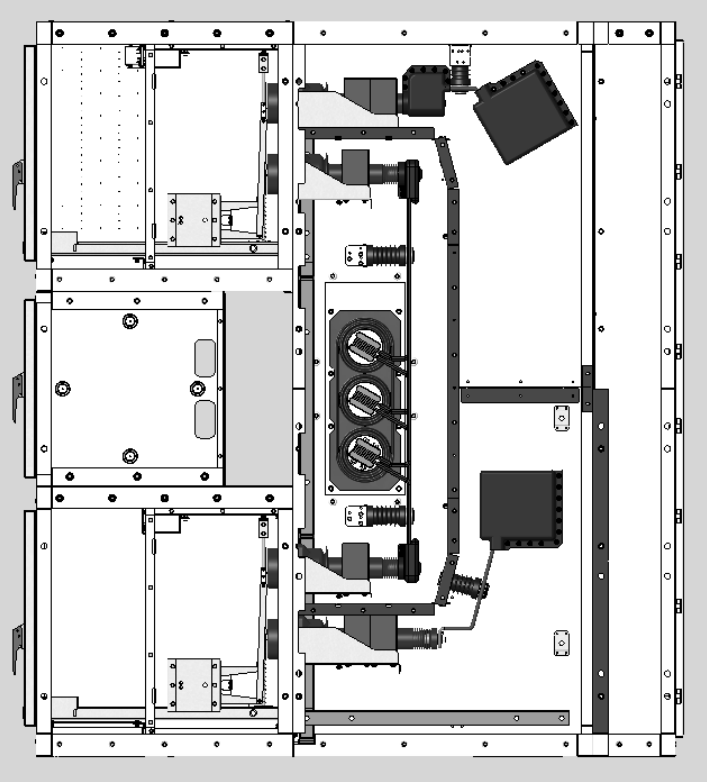
ReliaGear® ND
Configurations – MTM 2000 A



ReliaGear® ND
Frame side views



One-high configuration
up to 2000A



Two-high configuration
up to 1200A

ReliaGear® ND
Vmax/A breaker - overview

- Modular design using EL mechanism
- Quick change charge motor and trip/close coils
- Roll on floor option
- Standards
  - IEEE C37.04
  - IEEE C37.06
  - IEEE C37.09
- Average weight: 300 lbs.

ReliaGear® ND
Vmax/A breaker

Secondary plug

Manual charging handle

Open/close buttons

Breaker status

Operations counter

Roll on floor wheels

Latching handles

ReliaGear® ND
Vmax/A breaker – ratings and construction

Consists of three basic parts

- EL mechanism
- Charge motor
- Smart trip/close coils

Voltage (kV)	Main bus	Isc (kA)	Interrupt	Close & latch	BIL	Low frequency withstand	Interrupt time	No load mech endurance
		25	25	65	60	19	3	10000
	1200	31.5	31.5	82	60	19	3	10000
		25	25	65	60	19	3	10000
5	2000	31.5	31.5	82	60	19	3	10000
		25	25	95	95	36	3	10000
	1200	31.5	31.5	82	95	36	3	10000
		25	25	65	95	36	3	10000
15	2000	31.5	31.5	82	95	36	3	10000

ReliaGear® ND
Vmax/A breaker – EL mechanism

- Largest installed base for MV indoor breakers worldwide.
  - EL mechanism is applied to the complete line of ADVAC, VD4, Vmax and Emax breakers
  - Approximately 750,000 installed globally

ReliaGear® ND
Vmax/A breaker – trip/close coils and charge motor

- Smart coils have built in microprocessor for:
  - More efficient response
  - Over-current, short-circuit and over-temperature protections
  - Internal diagnostics for failure detection
- Quick and easy replacement of key components

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Values summary

- Small 26-inch wide footprint with two-high capabilities at 15 kV means more space savings
  - For PDC applications, cost per square foot is approximately $250
  - Small footprint means less weight = less shipping splits and faster installation time
- Vmax/A breaker:
  - Lightweight and maneuverable compared to industry standard
    - 300 lbs. versus 375 for comparable ratings
    - Roll on the floor option for easy removal
  - Modular quick change charge motor and coil design

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Questions?

Power and productivity
for a better world™