

Medium Voltage Switchgear

Distribution and Paralleling Switchgear

5kV – 15kV

APT
ADVANCED POWER
TECHNOLOGIES



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Product Line Brochure

APT
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TECHNOLOGIES

**PROVIDING A COMPREHENSIVE
APPROACH TO RELIABLE POWER**

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Features & Benefits



Switchgear

- Designed to comply with relevant ANSI and IEEE standards and generally exceed requirements of the applicable IEC standards
- Mechanical interlocks to prevent withdrawal or insertion of the circuit breaker when main contacts are not open. Circuit breaker cell mechanism maintains trip during insertion or withdrawal
- All live parts are enclosed in grounded metal compartments
- Grounded metal shutters automatically cover primary connections when circuit

Vacuum Circuit Breakers

- Draw-out (removable) vacuum circuit breakers
- High-speed operation – complete fault clearing in less than 3 cycles
- Hermetically sealed vacuum interrupters protect contacts from corroding elements and contamination
- Mechanism with integral manual charging handle
- Easy maintenance – contact wear indication

APT Medium Voltage Switchgear is configurable to meet any system requirements



Figure 2: Aux/Blank Over Breaker

Circuit breakers can be racked out with the doors closed. Lower circuit breaker will roll directly on the floor without need for any ramps or lifting devices for withdrawal or insertion.



Figure 1: Breaker Over Breaker



Figure 3: Blank/Aux Over Breaker

Rear compartments can be configured for load take offs, incoming sources, and transformers for the ultimate in flexibility



Figure 5: Rear section main bus with incoming source connections

Main bus is insulated silver plated copper, with bolted connections covered by insulating boots



Figure 4: Integrated Medium Voltage Transformer



Figure 6: Close-up of insulated silver plated copper main bus

Circuit Breaker

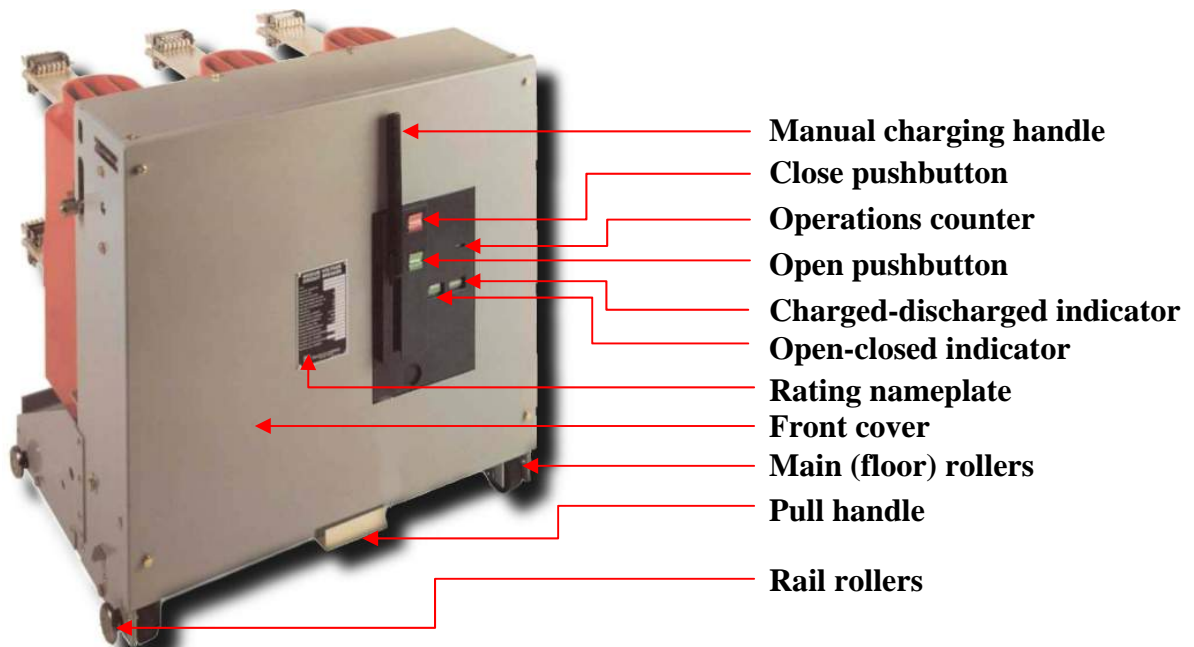


Figure 7: Circuit Breaker Front View

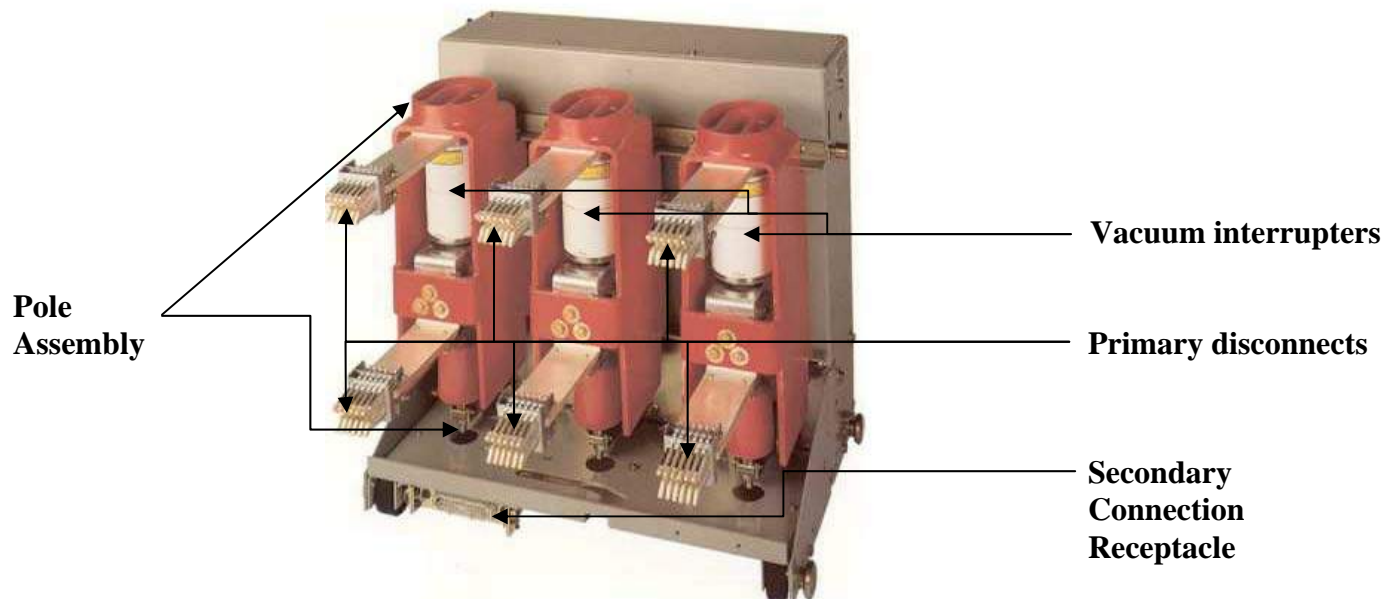


Figure 8: Circuit Breaker Rear View

Circuit Breaker Cell

Wiring
APT uses Type SIS wiring for all control, PT, and CT wiring within the MV Cell

Shorting Terminal Blocks
These terminal blocks are used for all CT wiring to ensure serviceability of energized equipment

M-O-C
Location for optional mechanism operated contacts indicating status of the breaker: open or closed

T-O-C
Location for optional auxiliary contacts indicating status of the breaker position: connected, test, or disconnected

Racking Interlock
This mechanism ensures a trip is maintained during racking of the circuit breaker into the cell

Shutters
When the breaker is removed the shutters automatically close separating the compartment from energized components

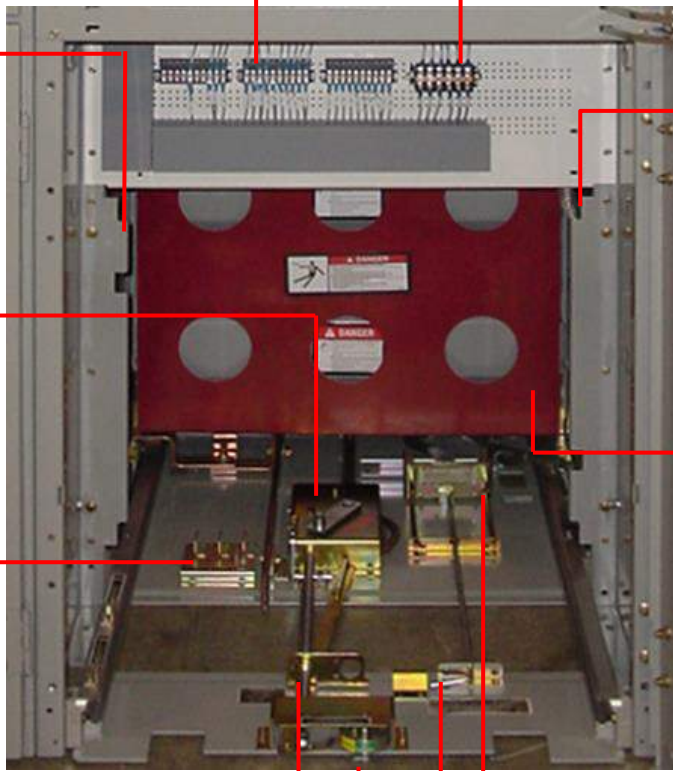
Breaker Rating Interlock
The cell can be keyed to eliminate the possibility of inserting an improperly rated circuit breaker

Padlock Provision
Racking mechanism can be locked to ensure racking of the circuit breaker into the or out of the cell is prohibited

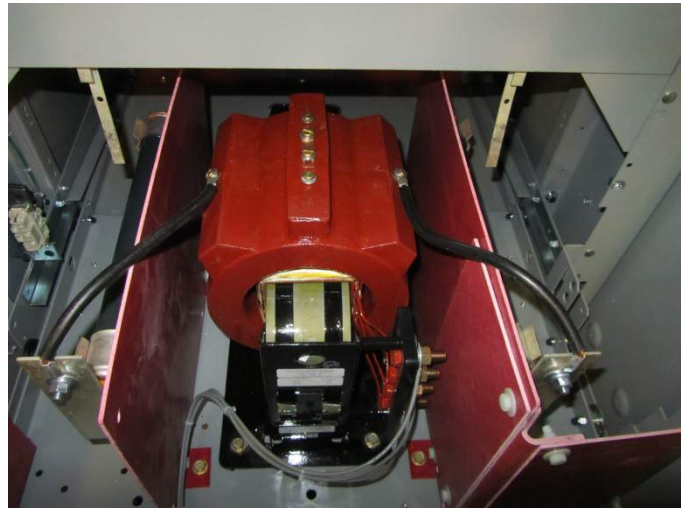
Breaker Secondary
Self-aligning plug connects automatically upon insertion of the circuit breaker

Breaker Position Indicator
Visible with the door open or closed the clearly marked, color coded indicator shows the breaker position as either connected or test/disconnected

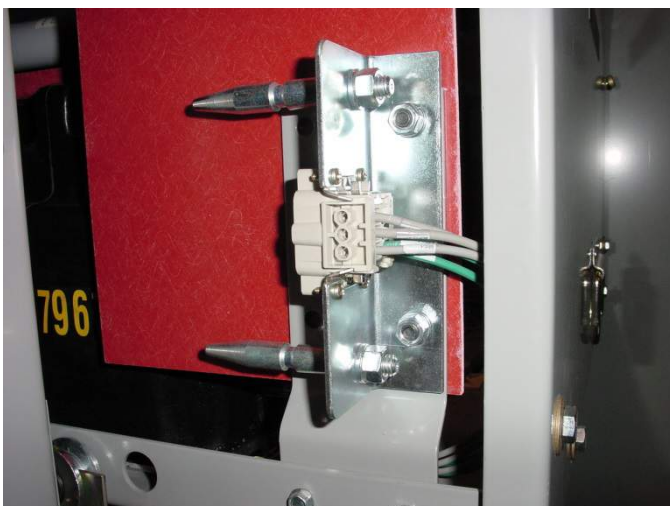
Breaker Secondary Handle
While the breaker is in the test position the secondary handle can be pulled to engage the secondary wiring with the breaker



Auxiliary Drawers



Auxiliary Drawers can accommodate Fuses, Control Power Transformers or Voltage Transformers. For operator safety these devices are automatically grounded during movement to disconnected position



Auxiliary Drawer Secondary
Contacts are of self-aligning design and can accommodate up to six independent circuits

Electric Remote Racking Device & Test Cabinet



Figure 9: Electric Racking Device with cable to accommodate remote racking of the circuit breaker up to 50 ft. away



Figure 10: Electric Racking Device installed onto switchgear section circuit breaker racking mechanism



Figure 11: Wall-mountable Circuit Breaker Test Cabinet

The Electronic Racking Device allows for electrically installing and removing devices to and from the CONNECTED position in the circuit breaker cell. It has a 50 ft. (15.2 m) long cord to allow for remote racking and contains a clutch that limits the torque applied to the circuit breaker racking gears



Figure 12: Test Cabinet circuit breaker connection plug to be inserted into secondary connection receptacle in rear of breaker

The wall mountable test cabinet is used to test the circuit breaker for proper operation when removed from the circuit breaker cell. An 8 ft. (2.4 m) cable with a connection plug that can be plugged directly into the rear of the circuit breaker into the secondary connection receptacle

Circuit Breaker Lift Truck



Figure 13: Lift Truck in drawout circuit breaker removal configuration



Figure 14: Lift Truck adapter to be used only for removal of Potential or Control Power Transformers (PTs or CPTs)

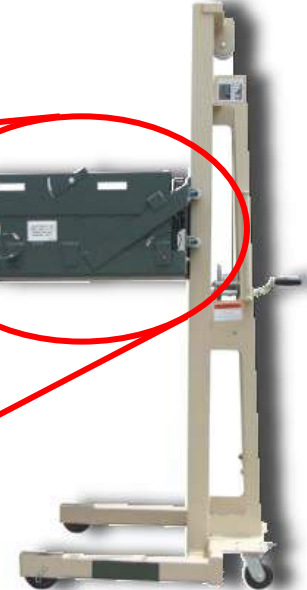


Figure 15: Lift Truck in drawout PT or CPT removal configuration



Figure 16: Lift truck pushed toward the circuit breaker cell so cradle is square for removal

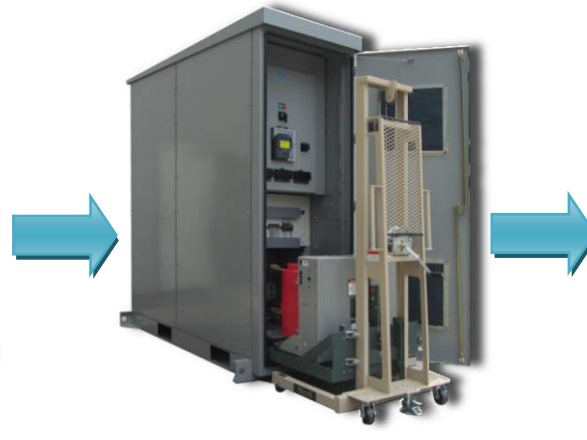


Figure 17: Circuit breaker rolled onto lift truck



Figure 18: Cradle raised to clear the blocks on each side of the circuit breaker cell rails



Figure 19: Lift truck removed with circuit breaker from the circuit breaker cell



Figure 20: Circuit breaker on lift truck cradle lowered to the floor



Figure 21: Circuit breaker removed from safety disconnect of lift truck and rolled onto the floor

Outdoor Non Walk-in

APT also offers medium voltage switchgear in an outdoor NEMA 3R non walk-in arrangement



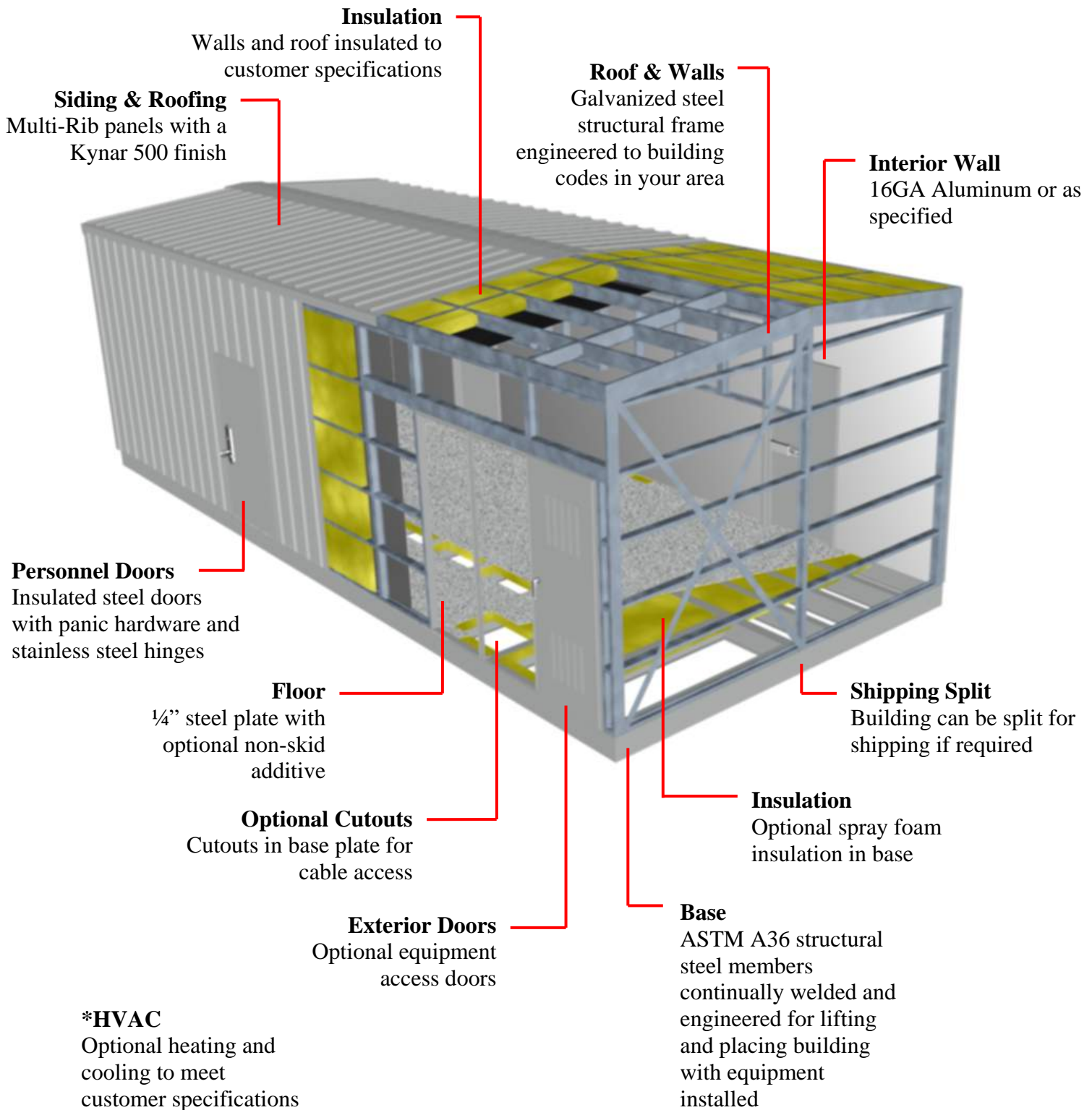
Outdoor Walk-in



*APT's outdoor walk-in
switchgear offers a clean
and safe work
environment in an
optional climate
controlled aisle*



Outdoor Walk-in



Circuit Breaker Ratings

MVA Rating (reference only)	Actual MVA @ Operating Voltage	Rated Continuous Current	Voltage		Dielectric Ratings		Short Circuit Current					Mechanical Endurance
			Max Rated Voltage	Range Factor	Power Frequency	Impulse 1.2 x 50µs	System Interrupting	Close and Latch Rating	Short-Time Current Rating	Short-Time Current Duration	Interrupting Time	No Load Mechanical Operations
		A RMS	kV RMS	K	kV RMS	kV peak	kA RMS	kA peak	kA RMS	s	Cycles	
250	330	1200	4.76	1.0	19	60	40	104	40	2	3	10,000
250	330	2000	4.76	1.0	19	60	40	104	40	2	3	10,000
250	330	3000	4.76	1.0	19	60	40	104	40	2	3	5000
350	412	1200	4.76	1.0	19	60	50	130	50	2	3	5000
350	412	2000	4.76	1.0	19	60	50	130	50	2	3	5000
350	412	3000	4.76	1.0	19	60	50	130	50	2	3	5000
500	572	1200	8.25	1.0	36	60	40	104	40	2	3	10,000
500	572	2000	8.25	1.0	36	95	40	104	40	2	3	10,000
500	572	3000	8.25	1.0	36	95	40	104	40	2	3	5000
500	650	1200	15	1.0	36	95	25	65	25	2	3	10,000
500	650	2000	15	1.0	36	95	25	65	25	2	3	10,000
500	650	3000	15	1.0	36	95	25	65	25	2	3	5000
750	1039	1200	15	1.0	36	95	40	104	40	2	3	10,000
750	1039	2000	15	1.0	36	95	40	104	40	2	3	10,000
750	1039	3000	15	1.0	36	95	40	104	40	2	3	5000
1000	1299	1200	15	1.0	36	95	50	130	50	2	3	5000
1000	1299	2000	15	1.0	36	95	50	130	50	2	3	5000
1000	1299	3000	15	1.0	36	95	50	130	50	2	3	5000

Services



Advanced Power Technologies (APT) offers a unique combination of Power Systems products and services. Our uniqueness and strength is our ability to assist in all phases of the project. At the beginning stages of the project, we can assist the Owner and Engineers in evaluating the existing power system, calculate the available fault currents and advise on the optimal switchgear configuration and operation. Our engineers can explain pros and cons and assist in selecting solidly grounded, low impedance grounded or high impedance grounded systems, various protective relaying, power monitoring and automation schemes as well as perform all the calculations necessary to supply equipment for a functional and coordinated power system.

When our equipment is installed, we can provide and oversee a comprehensive system commissioning, testing and integration. We will continue ongoing support during the lifetime of the installation.



Dimensions and Weight of Indoor Section

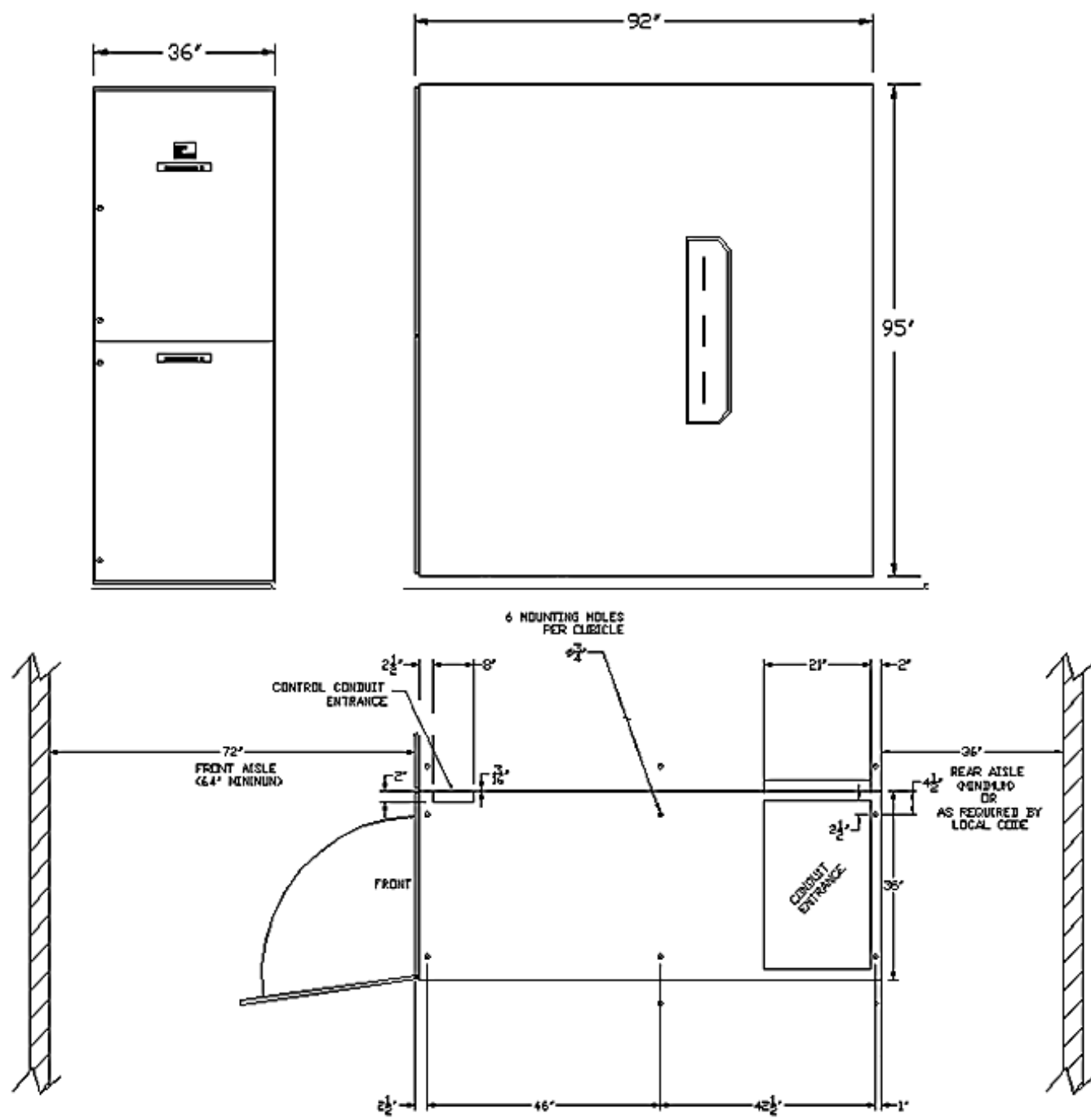
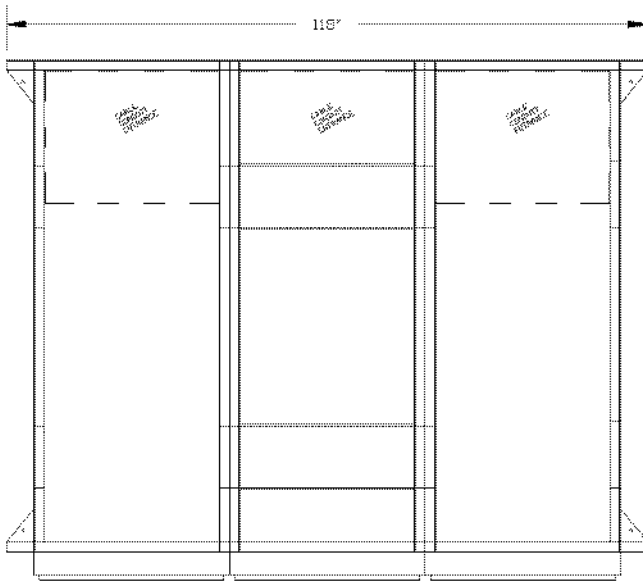


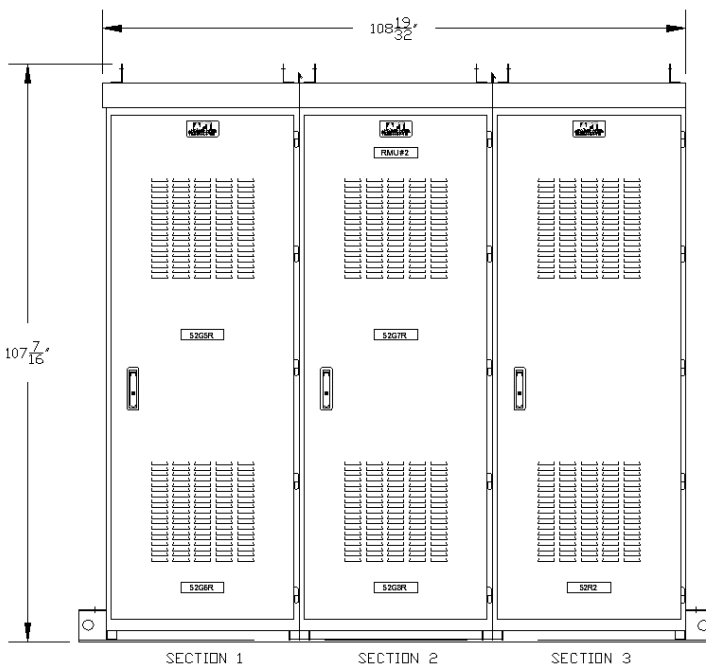
Table 2: Standard Section Weights

Component	Weight Per
NEMA 1 Section (Less Breakers)	2000 lbs.
NEMA 3R Section (Less Breakers)	3000 lbs.
1200A Circuit Breaker	360 lbs.
2000A Circuit Breaker	410 lbs.
3000A Circuit Breaker	480 lbs.

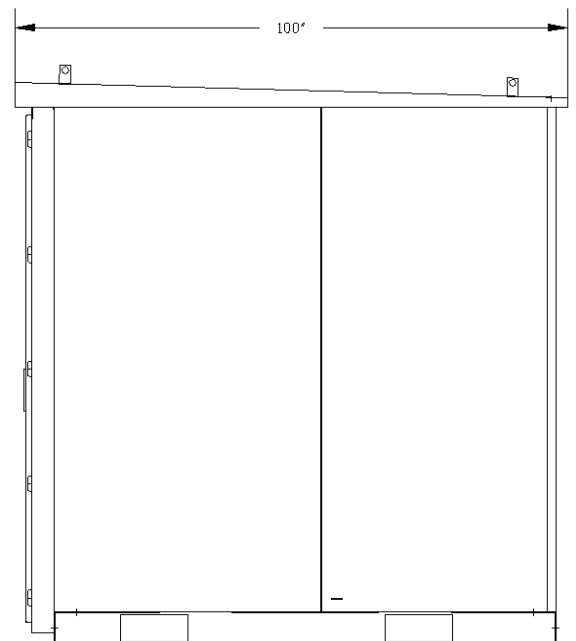
Typical Dimensions of NEMA 3R Non Walk-in



TOP VIEW



FRONT VIEW
(EXTERNAL)



RIGHT SIDE

Typical Dimensions of NEMA 3R Walk-in

