

Automatic Transfer Switchgear

Medium Voltage ATS

2.4kV-15kV



Product Line Brochure

Features



Figure 1: Source 1 PTs over Automatic Transfer Control Panel over Source 2 PTs



Figure 2: Source 1 Circuit Breaker over Source 2 Circuit Breaker

2.4kV-15kV (3Ø) Automatic Transfer Switchgear

- Design Amperages:
 - 1200A, 2000A (2 Sections)
 - 3000A (3 Sections)
- UL Tested to the following safety standards:
 - ANSI/IEEE C37.20.2 - Metal-Clad Switchgear
 - NEMA C37.54 - High-Voltage Circuit Breakers
 - NEMA C37.55 - Switchgear - Medium Voltage Metal-Clad Assemblies - Conformance Test
- Main bus:
 - Insulated silver plated copper, with bolted connections covered by insulating boots
- Symmetrical Interrupting Capacity:
 - 2.4/5kV: 40kA or 50 kA
 - 12.47kV, 13.2kV, 13.8kV/15kV: 25kA
- Vacuum Circuit Breaker Sizes
 - See Page 7 Table 1.
- Protective Relay Functions as required.
- Source Advanced Power Metering
 - UL recognized ANSI C12-20-1998 Class 10 0.5% Accuracy
- Enclosure
 - Available in NEMA 1 (indoor) and NEMA 3R (outdoor) installation.
 - Carbon steel.
 - Powder coated ANSI 61 Gray.
 - All hardware is stainless steel.
 - Door handles are padlockable.
 - Typical Section Dimensions:
 - See Pages 9 and 10
- Optional Features:
 - Metal Clad Construction
 - Downgraded Control Unit
 - Upgraded Control Unit

Standard Modes of Operation



Figure 4: Standard Automatic Transfer Control Panel

Automatic Transfer Operation:

1. When the generator is used as an Emergency source, the MV ATS will issue a start signal to the emergency generator upon sensing of failure of a Normal Source.
2. When a Normal Source failure is sensed by the MV ATS, and the Emergency Source is available, the Normal Source circuit breaker trips open and the Time Delay Neutral timer starts timing.
3. Once the Time Delay Neutral timer expires, the Emergency Source circuit breaker will close and the Emergency Source will be supplying power to the facility.
4. With the APT MV ATS, operators are given the flexibility to utilize whether an automatic or manual return to Normal Source operation by selecting the desired mode of operation via HMI.
5. A 100 mS Closed Transition Transfer back to the Normal Source is able to occur in the event that both sources are sensed to be synchronized. This will allow power from the Normal Source to resume feeding the load without causing a power outage.
6. When an automatic return to Normal Source mode of operation is selected, once the Normal Source is sensed to be healthy and Time Delay Emergency to Normal timer expires, and when the two power sources are in synch, the 100 mS closed transition to the Normal Source will occur. If the two power sources are in not synch, Emergency Source circuit breaker will open and the Normal Source circuit breaker will close after expiration of the adjustable Time Delay Neutral.



Figure 5: Optional Basic Circuit Breaker Control Panel with Automatic Transfer Control by Others

Manually initiated Transfer Operation:

1. Operators have the ability to initiate a manual transfer signal locally or remotely by customer SCADA or DCS system (via Modbus TCP/IP Ethernet), the Preferred Source circuit breaker trips open causing a power outage.
2. At this time, the Emergency Source circuit breaker closes and the Emergency Source is supplying power to the site load.
3. Operators have the option to automatically or manually initiate the transfer of the load back to the Normal Source.
4. A Closed Transition Transfer back to the Normal Source is able to occur in the event that both sources are sensed to be synchronized. This will allow power from the Normal Source to resume feeding the load without causing a power outage.
5. In the event that the two sources are sensed to be out of sync, the load will be disconnected from the power and an Open Transition Transfer will occur.

Note: When a source's Circuit Breaker control switch is in maintained "Open" position, the circuit breaker will not close, regardless of the operation of any other control.

Source sensing setpoints:

Undervoltage, overvoltage (adjustable in Volts) , underfrequency, overfrequency (adjustable in 1/100 of Hertz). Each setpoint has corresponding time delay adjustable in seconds.

Optional Transfer Options

- Automatic standby with (Soft loading/Unloading) operation:
 - Time delayed control sensor detects if a utility outage has occurred.
 - When timer expires, the generator set is automatically started and brought up to speed and voltage.
 - Utility circuit breaker and the designated feeder breakers will open and generator circuit breakers will close (after adjustable time delay). The synchronizing circuit breaker of the first available generator closes to a dead bus. At this time the generator is supplying power to the site load.
 - When a healthy utility is connected for a set time delay, the soft close transition of the load to the utility shall begin.
 - The generator bus synchronizes with the utility source. Once synchronized, the utility circuit breaker closes. At this time soft unloading of the generator set shall begin.
 - When the genset loads are gradually reduced to the level of the unload trip setpoint the generator synchronizing breakers trip open and the gensets are put in the cooldown mode of operation.
- Sustained Utility Paralleling operation:
 - Automatic transfer shall be configurable for the sustained Utility Paralleling operation as initiated and controlled by the generator paralleling switchgear.
- Base load:
 - This mode soft loads the generator set to a constant load level against utility.
- Import/export control:
 - This mode seeks to maintain constant utility contribution to a site load. This is accomplished by monitoring utility contribution and trimming generator set load levels up and down as site loads change. Import control means the generator set is contributing less than the total site load requirements and the utility supplies the difference. Export control means the generator set is contributing more than the total site load requirements and the utility is absorbing the difference.
- Automatic Transfer control can be provided by others.
- For more information for more **Transfer Options**, please contact APT.



Figure 6: Single Section Indoor NEMA 1 ATS
Circuit Breaker Section
(Left: Front, Right: Rear)



Figure 7: Main bus is insulated silver
plated copper, with bolted connections
covered by insulating boots.

Circuit Breaker

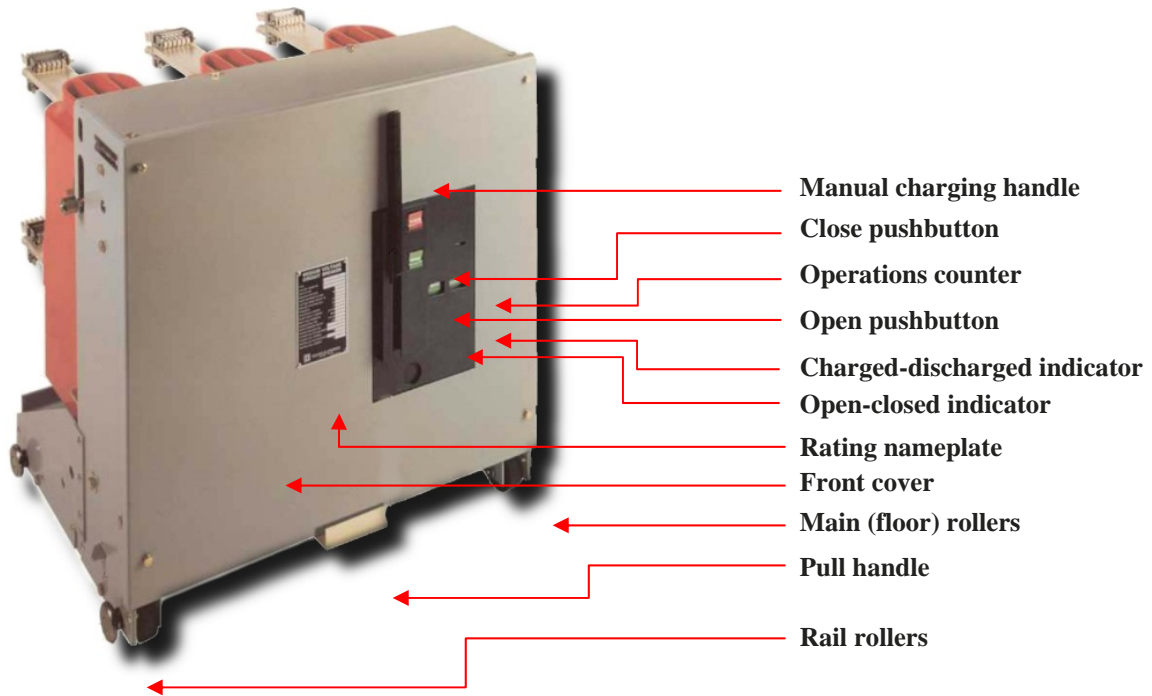


Figure 8: Circuit Breaker Front View

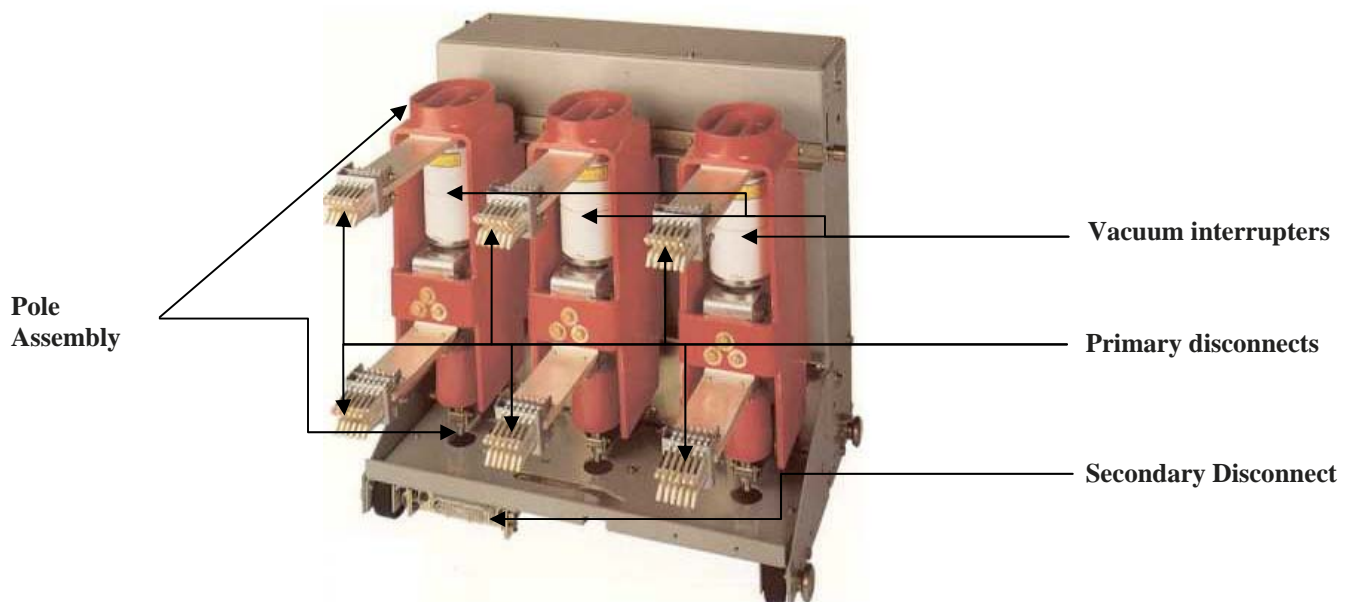


Figure 9: Circuit Breaker Rear View

Circuit Breaker Cell

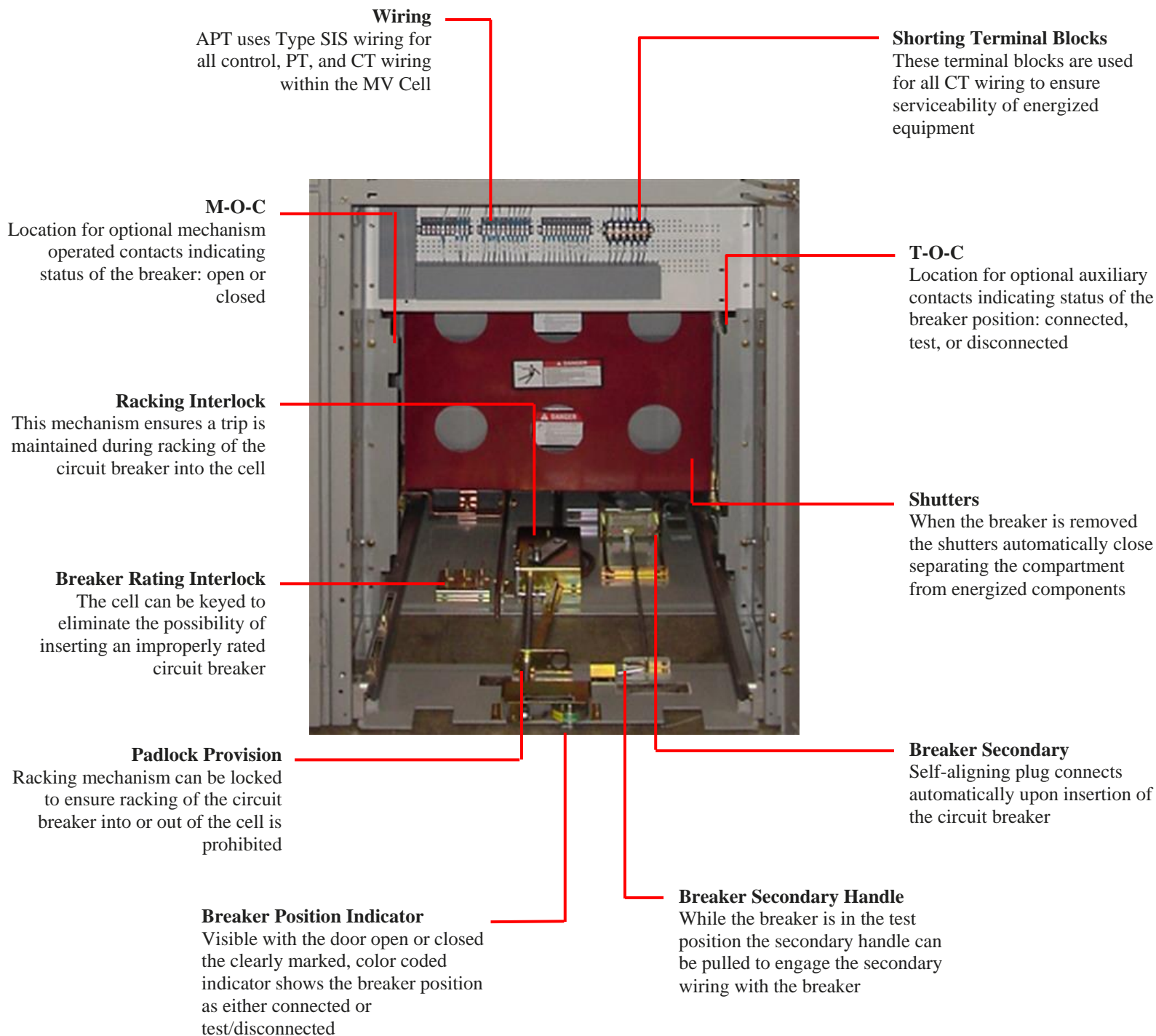


Figure 10: Inside Circuit Breaker Cell Diagram

Circuit Breaker Ratings & Weights Tables

Table 1: 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

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.

Auxiliary Drawers & Devices



Figure 11: Inside Voltage Transformer Drawer



Figure 12: Self-Aligning Drawer Contacts

Auxiliary Drawers accommodate Voltage Transformers. For operator safety these devices are automatically grounded during movement to disconnected position



Figure 13: Self-contained Control Power Battery Charging System for Control Power



Figure 14: Optional Wall-mountable Circuit Breaker Test Cabinet

Dimensions of NEMA 1 Sections

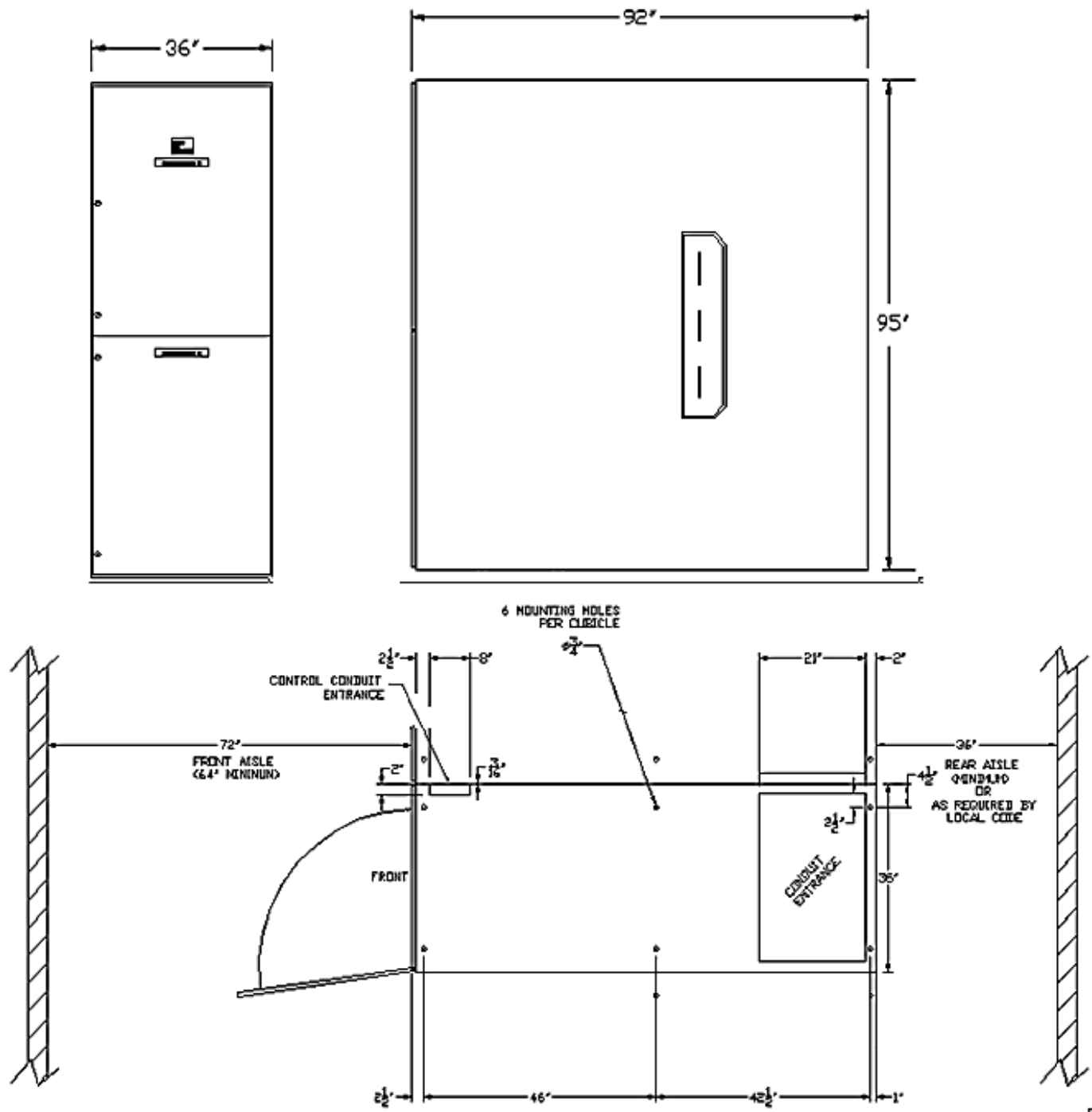


Figure 15: Single Section Layout

Dimensions of NEMA 3R Sections

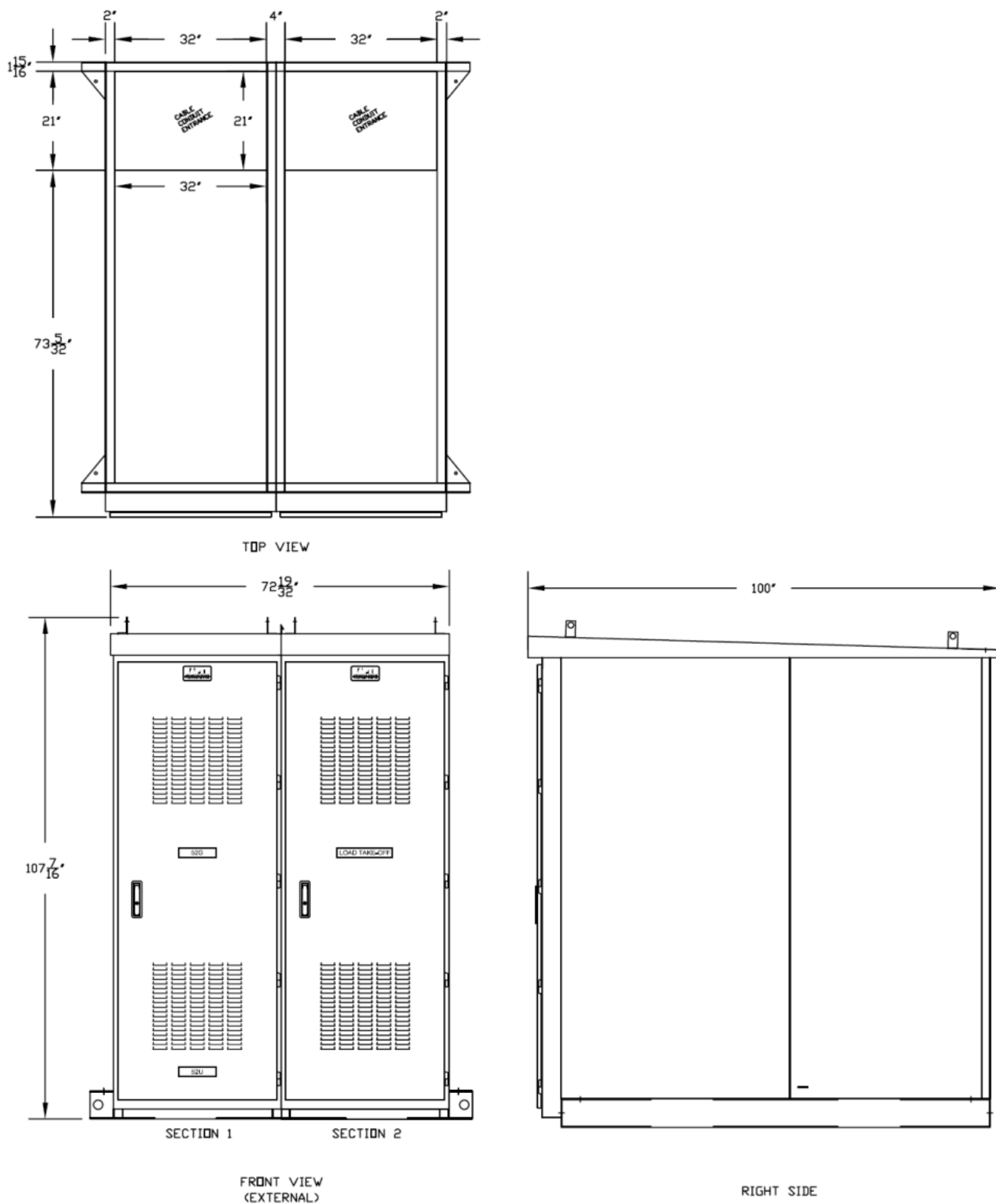


Figure 16: Overall External Layout