



- Company Introduction
- Quality & Production Capabilities
- Technical Information
- Photos and Descriptions



Corporate Headquarters

**Filnor, Inc.**

227 North Freedom Ave.

Alliance, OH 44601

United States

Major markets located nearby:

- Pittsburgh - 76 miles
- Cleveland - 57 miles
- Columbus - 147 miles
- Akron/Canton Airport - 16 miles



**Since 1970, Filnor has designed and manufactured products for industries worldwide:**

- Paper Mills
- Aluminum Plants
- Ship Building
- Automotive
- Construction
- Mining
- Mass Transit
- Utilities
- Power Generation
- Steel
- Telecommunications



## Filnor's Product Groups

- Power Resistors
- Disconnect Switches
- AC & DC Power Distribution Equipment & Controls



## Power Resistor Applications

- Neutral Grounding Resistors
- AC & DC Motor Acceleration
- Dynamic Braking
- Load Banks
- Harmonic Filtering
- Crane Control
- Transit
- Mining Equipment



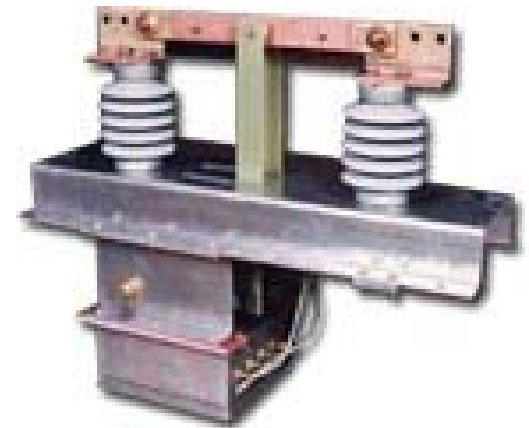
## Disconnect Switch Capabilities

- Current Ratings: 30 ampere- 20 kA
- Voltage Ratings AC/DC: 250 to 38 kV
- Open Panel Mounting
- Enclosed: Nema 1 - Nema 4X, IP23 – IP66



## Switch Designs

- Knife Switches
- Bolted Pressure Contact Switches
- High Current DB Switches
- Medium Voltage Switches - Up to 38 kV
- Transfer Switches
- Special Design Switches



# AC & DC Power Distribution and Controls

## Capabilities

- AC and DC panelboard
- AC and DC switchboards
- Custom power distribution equipment
- Custom control equipment





# Transit Projects Sample Listings

| <u>Contract Name</u>     | <u>Product Description</u>  |
|--------------------------|---|
| DFW – Airport            | A & B Switchgear Line Up<br>Switch, Fuse, Contactor Assembly  |
| MARTA – North Line       | Switch, Fuse, Contactor Assembly  |
| LIRR M7                  | Intercar Bus Line Fuse & Enclosure  |
| NYCTA R142<br>NYTCA R160 | Main Vehicle Disconnect<br>Main Vehicle Disconnect  |
| CTA Series 3200          | Switch, Rev Contactor, Resistors  |
| WMATA 3000<br>WMATA 6000 | Main Vehicle Disconnect<br>Main Vehicle Disconnect  |
| Las Vegas Monorail       | Power Switches, Wayside Switchgear  |
| Vancouver Skytrain       | Main Rail Disconnects & Wayside<br>Switches   |
| MARTA                    | Main Vehicle Disconnects  |
| SEPTA                    | Main Vehicle Disconnects  |
| San Francisco Muni LRV   | Main Vehicle Disconnects  |
| Ten Urbano Puerto Rico   | Fuse Box Assembly   |
| BART                     | Main Vehicle Disconnects  |
| NYCTA R62                | Main Vehicle Disconnects  |
| MTA BARTA                | Dynamic Braking Resistors, Main<br>Vehicle Disconnects, Line Charging<br>Resistors, & Battery Disconnects |



## Quality & Production Capabilities

- Quality System and Testing
- Production Capabilities
- Experience and Product Deliveries
- Service and Warranties



# Quality System Certification

**ISO9001** certified since August of 1999



*“Quality Products and Services Delivered On Time”*



## Resources

### Complete In-house Machine Shop

- Quality
- Delivery
- React to Emergency Situations and unique requirements



## Experience, Expectation and Delivery

### Warranty

- Standard One Year
- Special Customer Agreement Warranties

### Service Team

- Very Well-Trained Staff – Hands On Experience
- Engineering and Technicians



Transit Trackside Switches and Switchboards

## Technical Presentation

- Bolted Pressure Contact Switches Overview
- Projects and Photos



## What is a Bolted Pressure Contact Switch ?

The switch consists of two parallel movable blades with stationary contacts at each end.

A bolt passes through the blades, hinge and clip stationary contacts and a fixed clamping nut.

Pressure is applied on the contacts by rotating the clip and hinge bolts, connected together by a linkage assembly, effectively tightening the joint.

The result is a joint current carrying capacity similar to bolted bus bar.



## Design Criteria and Features

Engineered to ensure reliability, safety, ease of operation, and low maintenance.

### Switch Current Carrying Materials & Features:

- Switch current carrying members are ETP 110 Copper Bar
- Terminals and Contact interface Silver Plated - .0005 minimum
- Silver Plating ensures low contact resistance and is not affected by oxidation
- Current Density designed to 1kA amps per square inch
- Switch designed for current flow straight through switch to reduce overload stresses
- Vertical Terminals with Standard Nema hole pattern





## Design Criteria and Features

- GPO-3 insulating base – ease of mounting
- Switches can be supplied open frame or enclosed
- Manual or Motor operated
- Mechanical Interlock
- Options supplied are Auxiliary Switches, Key interlock Provisions and Specific Customer custom features.



## Design Criteria and Features

### Switch Testing:

- Individual units prior to shipment are factory tested for dielectric withstand, contact resistance, dimensional outline, and build configuration.
- A copy of factory test report is included with each switch
- Each unit is date coded on label for tracking purposes
- Applicable warning signs applied
- Designed to tested to applicable standard





**Quality Products And Services  
... Delivered On Time**



**Filnor Inc. is a designer and manufacturer of Power Resistors, Disconnect Switches, Control Equipment and Transit Products.**

**Filnor has been manufacturing industrial electrical products and controls since 1970.**

**ISO 9001**  
Quality System Certified



## **TRANSIT TRACKSIDE EQUIPMENT**

- **THIRD RAIL ISOLATION SWITCHES**
- **SUBSTATION SWITCHES**
- **EARTHING SWITCHES**
- **TROLLEY DISCONNECT**
- **TRANSFER SWITCHES**
- **DC SWITCHBOARDS**
- **RECTIFIER DISCONNECT SWITCHES**





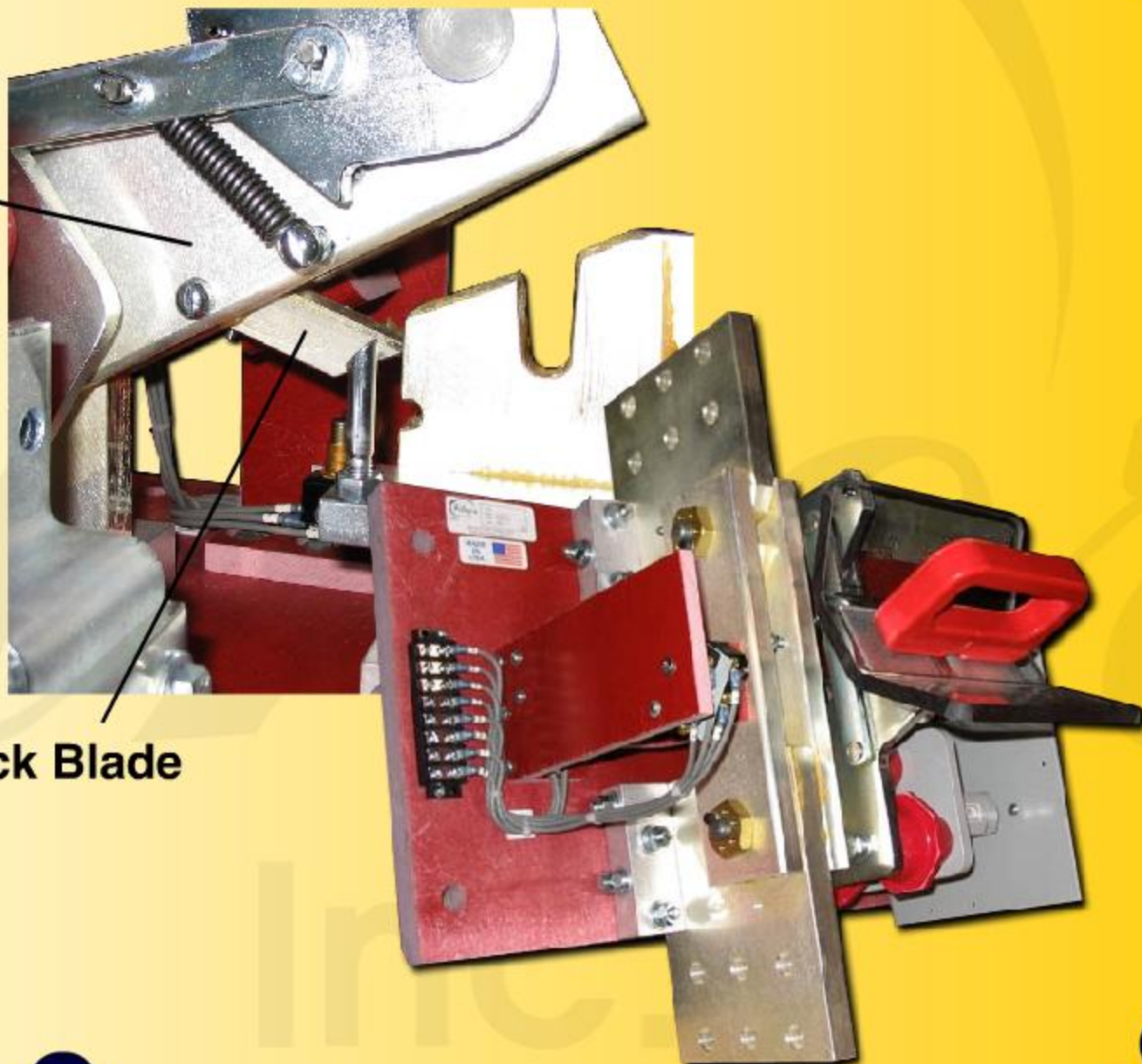


## RAIL ISOLATION SWITCH

### St. Louis Transit

- 4000 Amp
- 1000 Volt
- Manual Operated
- Auxilliary Contacts
- Quick Blade Feature

Main Blade



Quick Blade



## RAIL ISOLATION SWITCH

### St. Louis Transit

- 4000 Amp
- 1000 Volt
- Motor Operated
- Auxilliary Contacts
- Quick Blade Feature



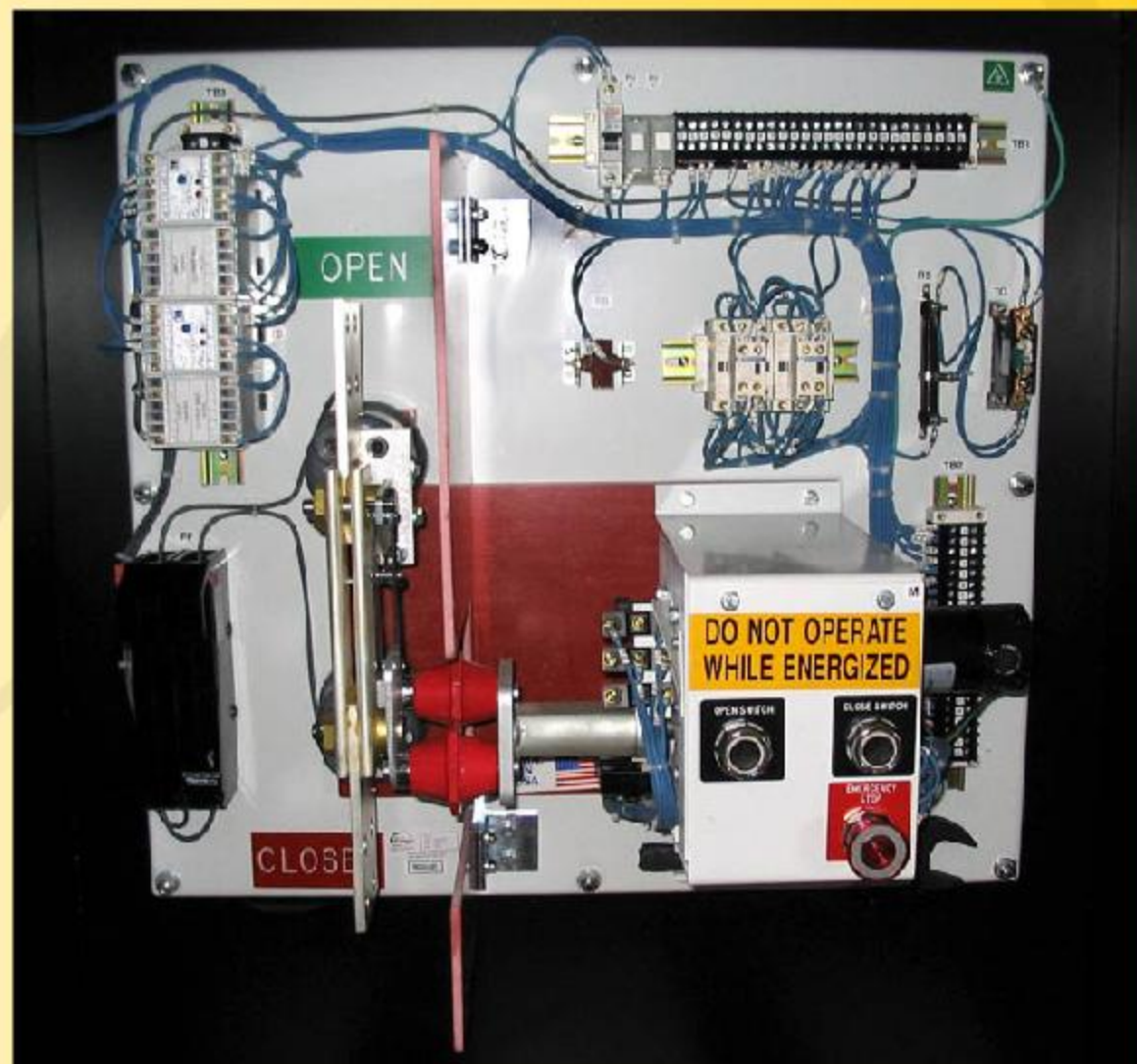




## RAIL ISOLATION SWITCH

### DART

- 1200 Amp
- 1000 Volt
- Motor Operated
- Voltage Sensing Circuit
- NEMA 4X Enclosure





## RAIL ISOLATION SWITCH

### Vancouver Sky Train

- 4500 Amp
- 1000 VDC
- 2 -Pole, Single Throw
- 200 Amp
- 4-Pole, Single Throw
- Auxiliaries
- Motor Operated
- Voltage Sensing Circuitry
- Viewing Windows







## RAIL ISOLATION SWITCH

### Vancouver Sky Train

- 4500 Amp
- 1000 VDC
- 2 -Pole, Single Throw
- 200 Amp
- 4-Pole, Single Throw
- Auxiliaries
- Motor Operated
- Voltage Sensing Circuitry
- Viewing Windows





## **TRANSIT TRACKSIDE EQUIPMENT**

- **THIRD RAIL ISOLATION SWITCHES**
- **SUBSTATION SWITCHES**
- **EARTHING SWITCHES**
- **TROLLEY DISCONNECT**
- **TRANSFER SWITCHES**
- **DC SWITCHBOARDS**
- **RECTIFIER DISCONNECT SWITCHES**



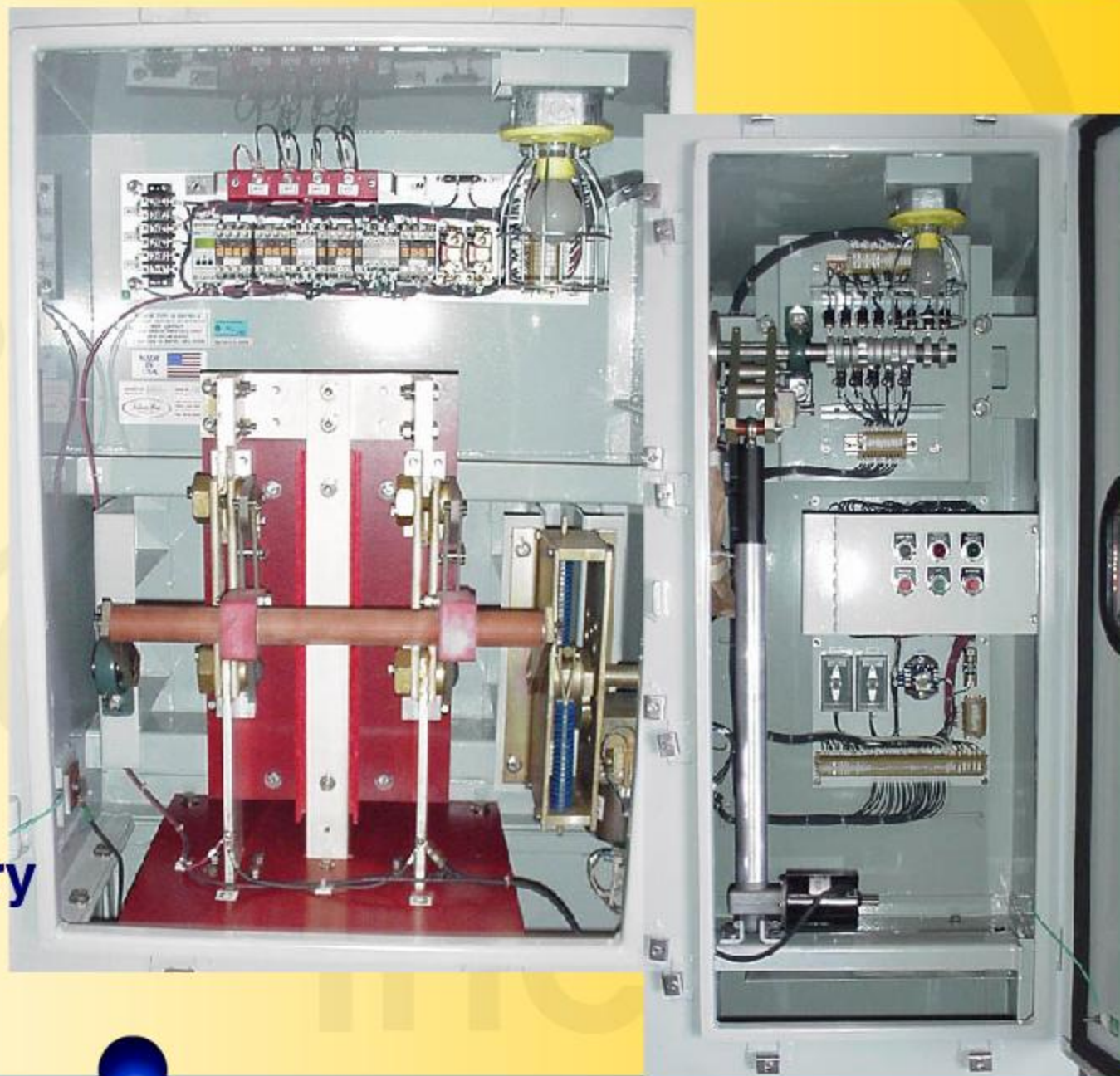




## GROUNDING SWITCH

### Vancouver Sky Train

- 1200 Amp
- 1000 VDC
- 2 -Pole, Single Throw
- Auxiliaries
- Motor Operated
- Voltage Sensing Circuitry
- Spring Operated
- Viewing Windows







## DC SWITCHBOARD

### DFW Airport

- 1000 DC Volt
- Switchboard Lineup
- Transit Application
- Switch, Fuse, Contactor
- Key Interlock System

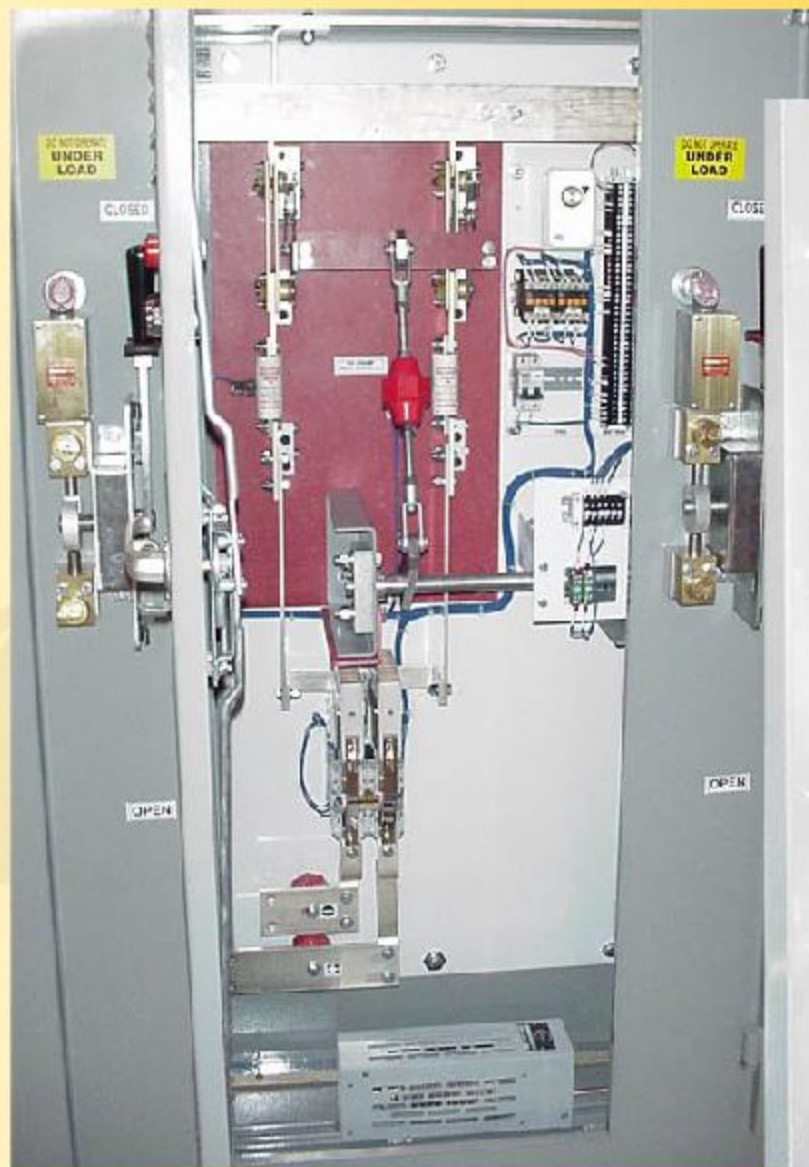




## DC SWITCHBOARD

### DFW Airport

- 1000 DC Volt
- Switchboard Lineup
- Transit Application
- Switch, Fuse, Contactor
- Key Interlock System







## DC SWITCHBOARD

### MARTA

- 1000 DC Volt
- Switchboard Lineup
- Transit Application
- Switch, Fuse, Contactor





## DC SWITCHBOARD

### MARTA

- 1000 DC Volt
- Switchboard Lineup
- Transit Application
- Switch, Fuse, Contactor







## DC SWITCHBOARD

### Las Vegas Monorail

- 1000 DC Volt
- Switchboard Lineup
- Transit Application
- Maintenance Facility
- PLC Logic
- Switch, Fuse, Contactor







## DC SWITCHBOARD

### Las Vegas Monorail

- 1000 DC Volt
- Switchboard Lineup
- Transit Application
- Maintenance Facility
- PLC Logic
- Switch, Fuse, Contactor





## RAIL DISCONNECT SWITCH

### Las Vegas Monorail

- 1000 DC Volt
- Contactor Fuse Assembly
- PLC Logic
- NEMA 4X Enclosure



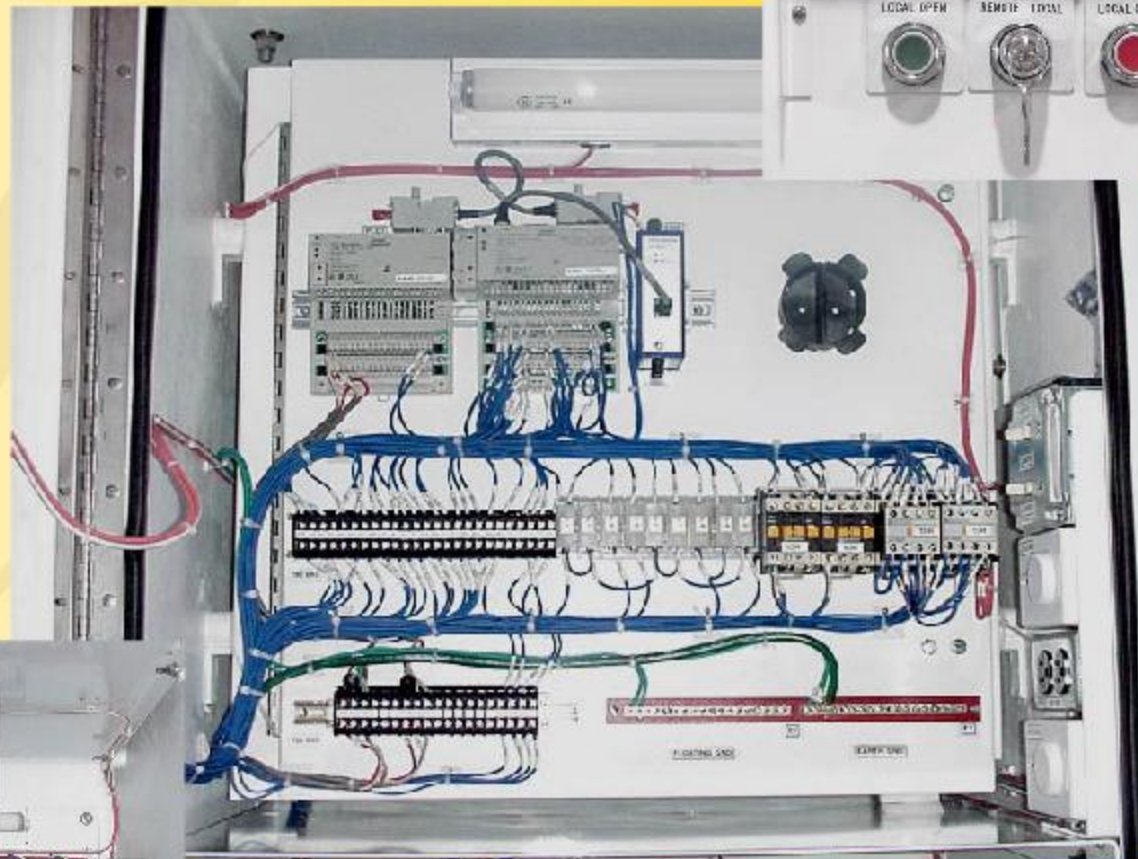




## RAIL DISCONNECT SWITCH

### Las Vegas Monorail

- 1000 DC Volt
- Contactor Fuse Assembly
- PLC Logic
- NEMA 4X Enclosure





## TRANSFER SWITCH

- 1200 Amp
- 1500 Volt
- Manual Operated
- Transfer Switch
- Key Interlock System







## RAIL HEATER DISCONNECT SWITCH

### WMATA

- 200 Amp
- 1000 Volt
- One Pole
- NEMA 4X Enclosure
- Viewing Window
- Spring Operated

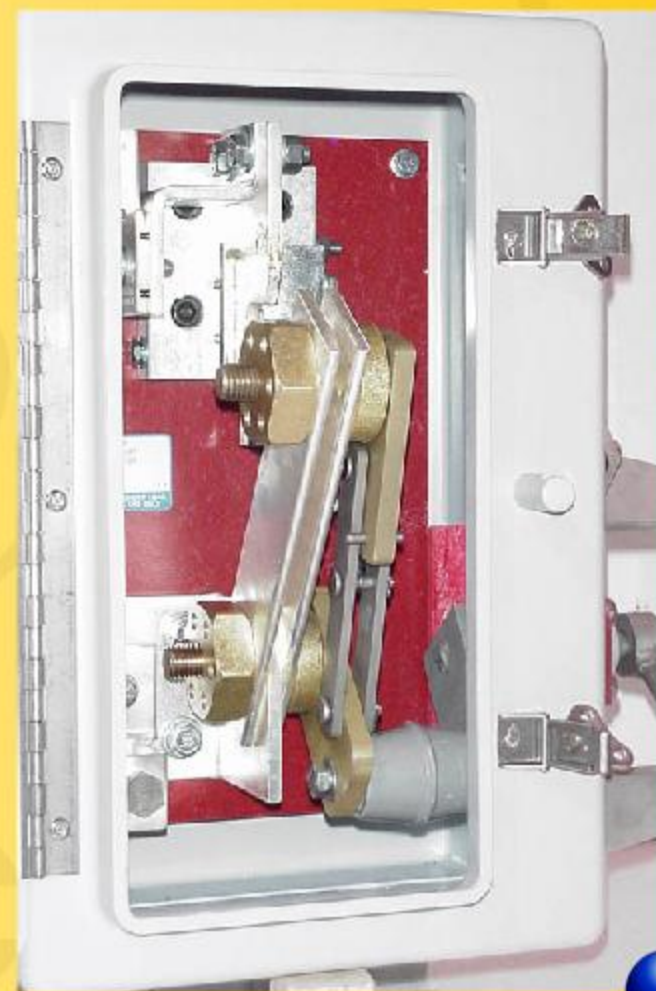




## TROLLEY LINE DISCONNECT SWITCH

### SEPTA

- 600 Amp
- 1000 Volt
- One Pole
- NEMA 4X Enclosure







## TRANSIT VEHICLE ELECTRICAL EQUIPMENT

- Main Vehicle Disconnect Switches
- Fuse Boxes
- Braking Resistors
- Snubber Resistors
- Truck Vehicle Disconnect Switches
- Polarity Reversing Switches





## TRANSIT MAIN VEHICLE DISCONNECT SWITCH

### NEW YORK CITY

- 1200 Amp
- 1000 Volt
- One Pole
- Double Throw
- NEMA 4X Enclosure
- Four Position
  - Run
  - Auxilliary from Third Rail
  - Open
  - Shop Test







## TRANSIT VEHICLE FUSE BOXES

### M7 & LONG ISLAND RR

- Inner Car Bus Line Fuse
- 1500 Amp
- 1500 Volt
- Ribbon Fuse
- Undercar Hung

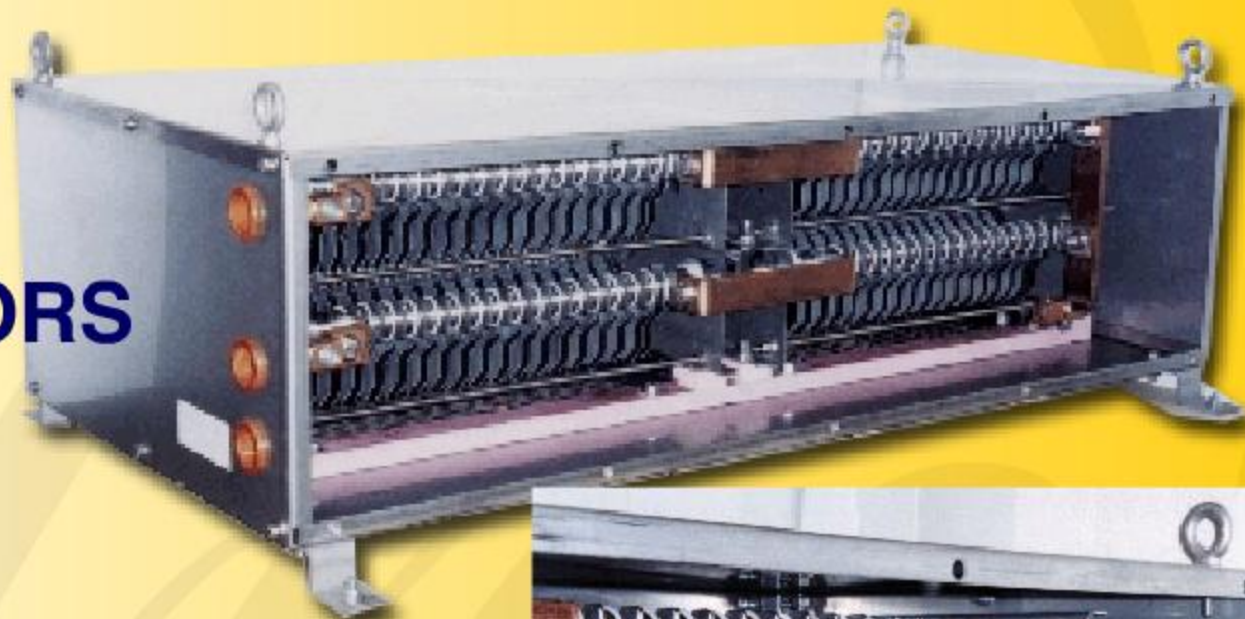






## **TRANSIT BRAKING RESISTORS**

- **Designed for roof mounted or under car hung**
- **Compact, lightweight, rugged designs for severe applications**
- **Filnor designs can be used on light or heavy rail vehicles or trackside braking**







## TRANSIT BRAKING RESISTORS

### NEW YORK CITY

- **Trackside Braking Resistors**
- **Convection or Fan Cooled Designs**

