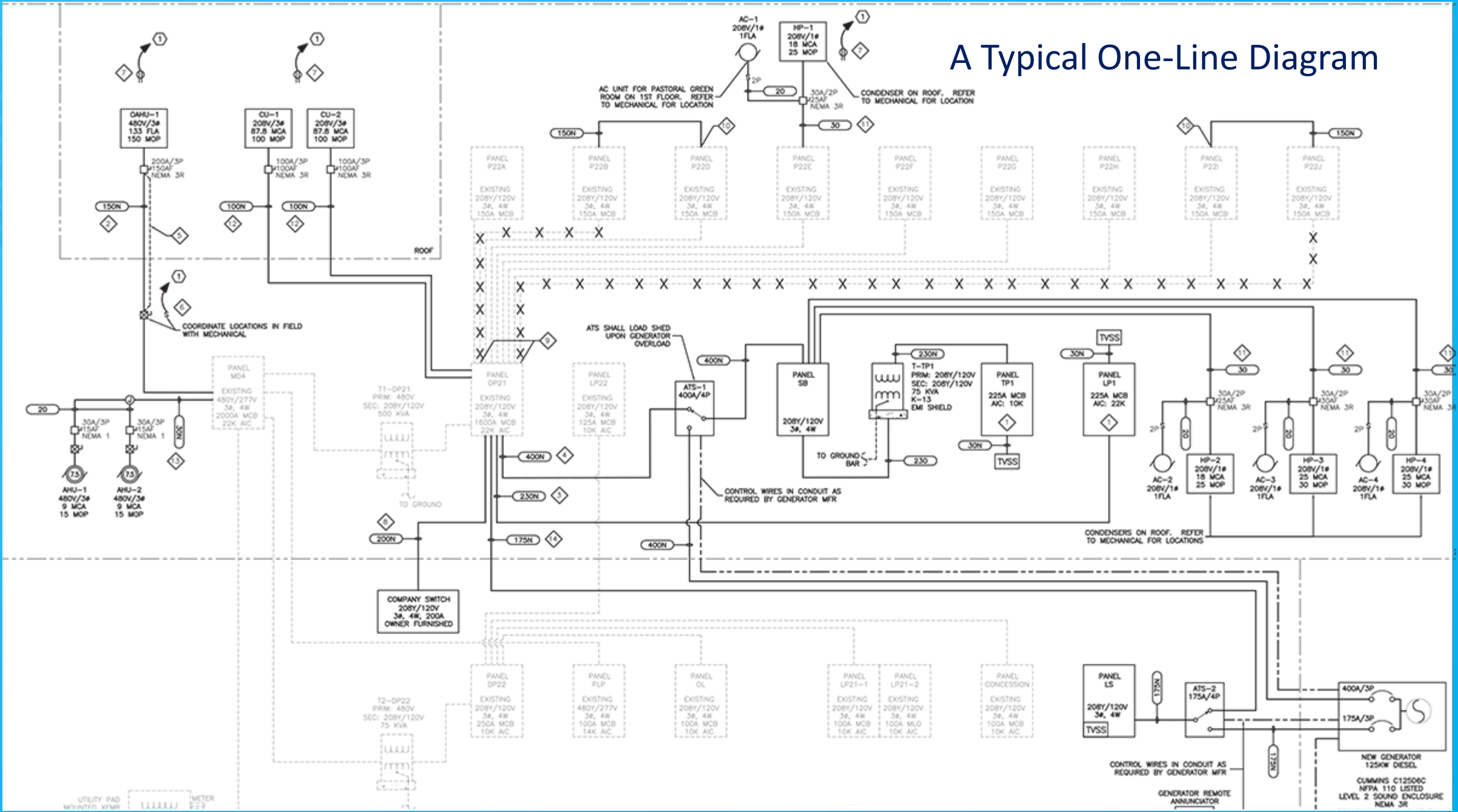
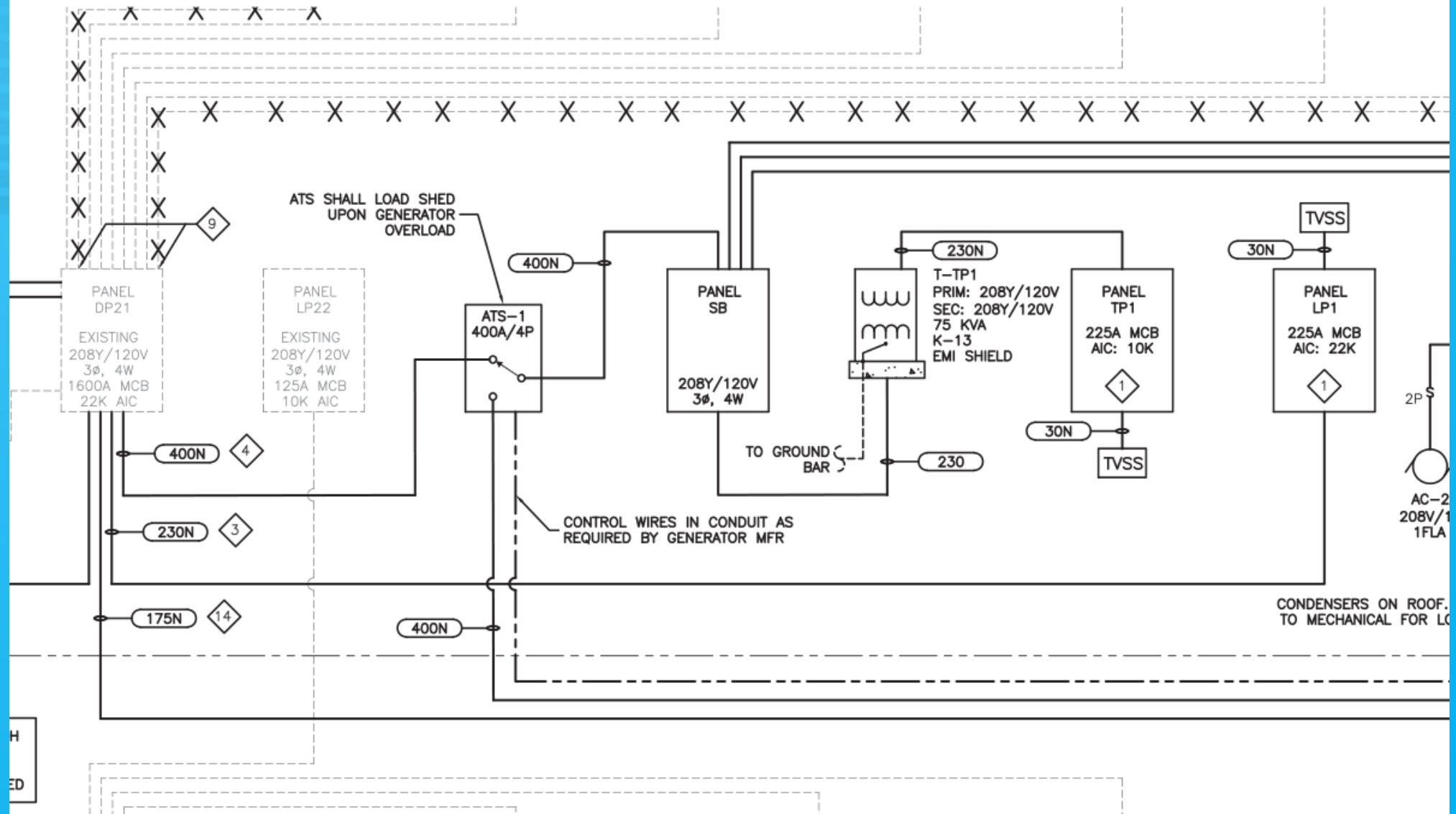


Right sizing your power
control electrical equipment

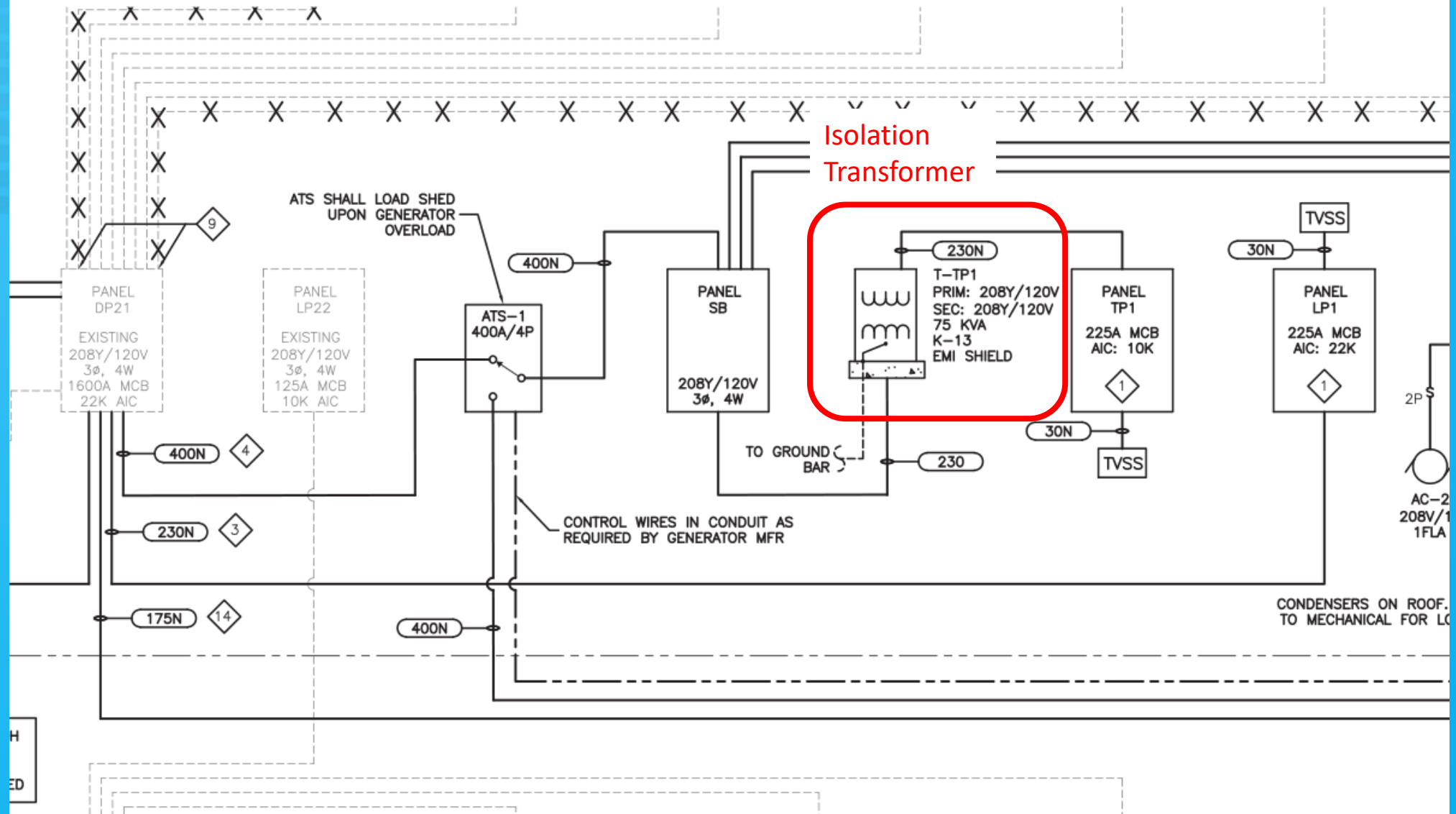
A Typical One-Line Diagram



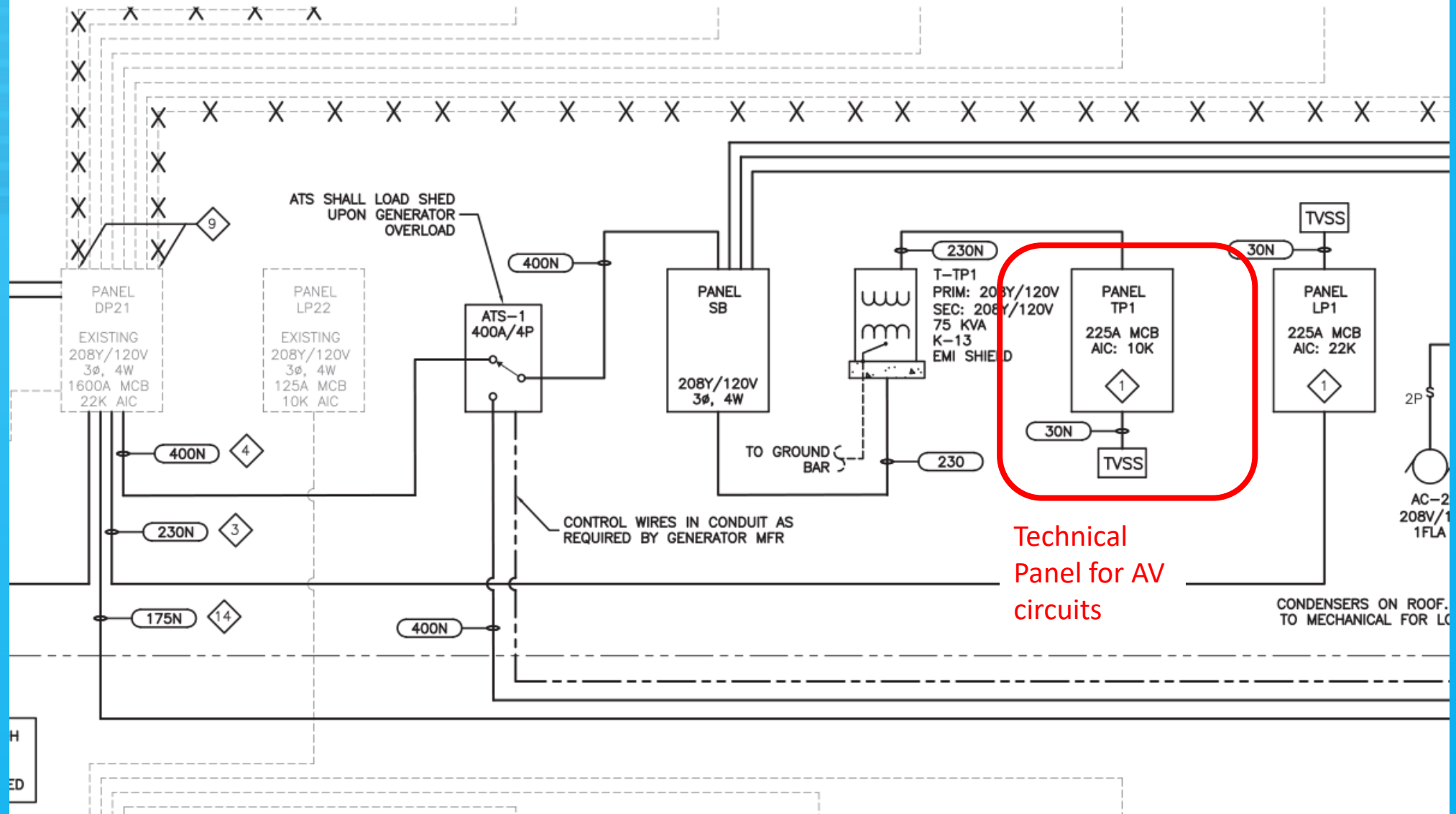
A Typical One-Line Diagram



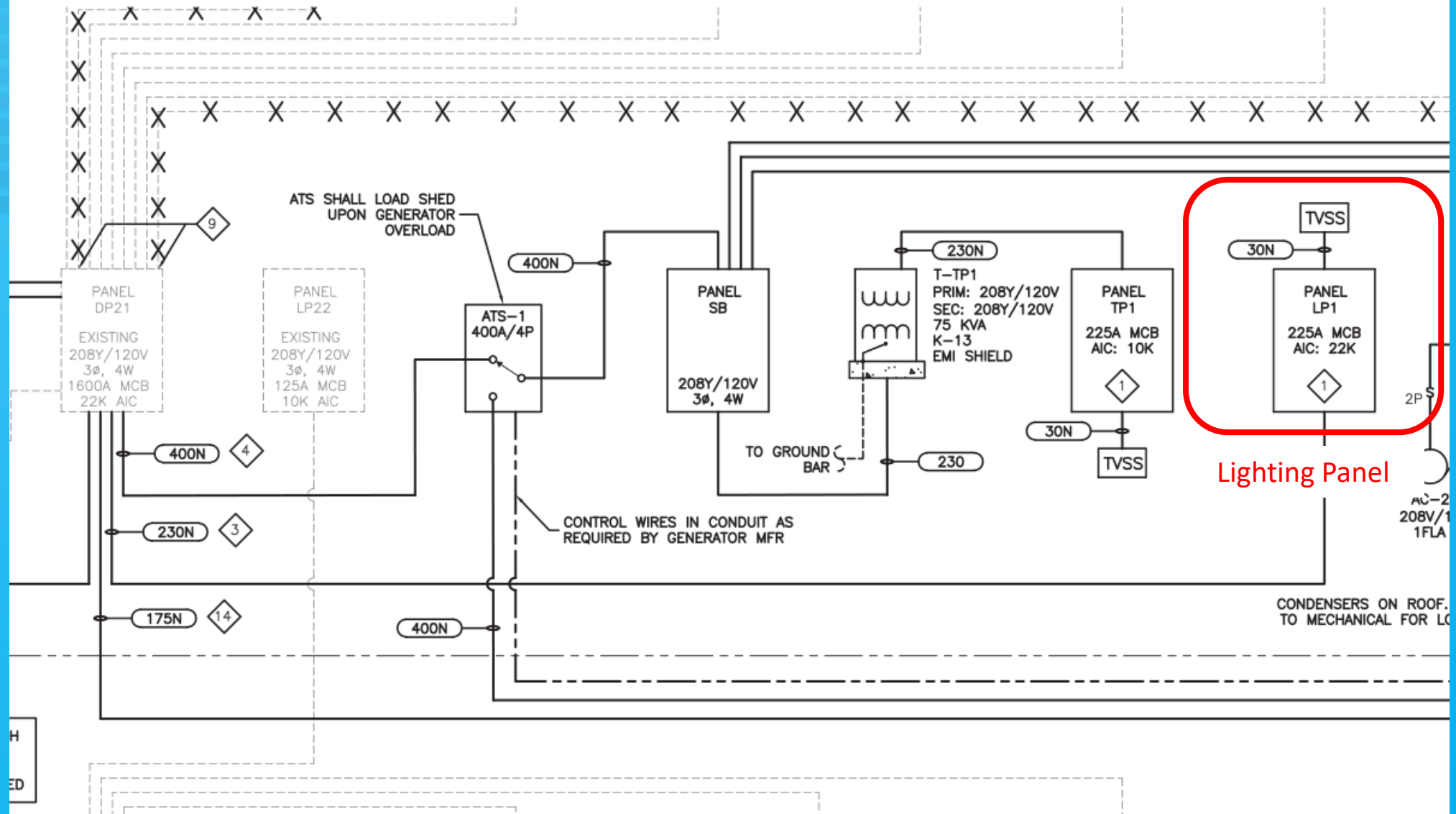
A Typical One-Line Diagram



A Typical One-Line Diagram



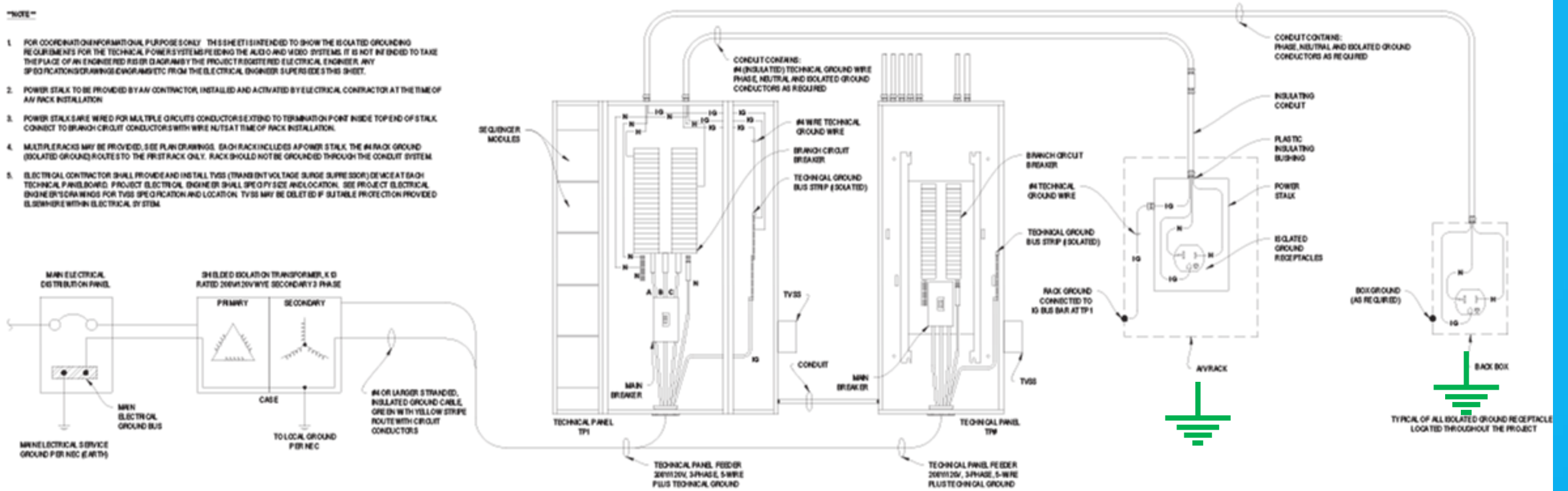
A Typical One-Line Diagram



AVL SYSTEMS ISOLATED GROUNDING REQUIREMENTS

"NOTE"

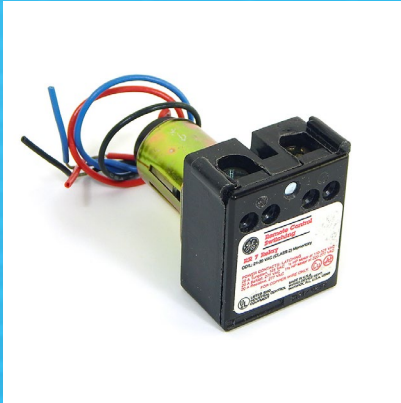
- FOR COORDINATION PURPOSES ONLY. THIS SHEET IS INTENDED TO SHOW THE ISOLATED GROUNDING REQUIREMENTS FOR THE TECHNICAL POWER SYSTEMS FEEDING THE AUDIO AND VIDEO SYSTEMS. IT IS NOT INTENDED TO TAKE THE PLACE OF AN ENGINEERED RISE OR DIAGRAM BY THE PROJECT REGISTERED ELECTRICAL ENGINEER. ANY SPECIFICATIONS DRAWINGS OR DIAGRAMS FROM THE ELECTRICAL ENGINEER SUPERSEDES THIS SHEET.
- POWER STALK TO BE PROVIDED BY AV CONTRACTOR, INSTALLED AND ACTIVATED BY ELECTRICAL CONTRACTOR AT THE TIME OF AV RACK INSTALLATION.
- POWER STALKS ARE WIRED FOR MULTIPLE CIRCUITS. CONDUCTORS EXTEND TO TERMINATION POINT INSIDE TOP END OF STALK. CONNECT TO BRANCH CIRCUIT CONDUCTORS WITH WIRE NUTS AT TIME OF RACK INSTALLATION.
- MULTIPLE RACKS MAY BE PROVIDED. SEE PLAN DRAWINGS. EACH RACK INCLUDES A POWER STALK, THE #4 RACK GROUND (ISOLATED GROUND) ROUTE TO THE FIRST RACK ONLY. RACK SHOULD NOT BE GROUNDED THROUGH THE CONDUIT SYSTEM.
- ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL TVSS (TRANSIENT VOLTAGE SURGE SUPPRESSOR) DEVICES AT EACH TECHNICAL PANEL. PROJECT ELECTRICAL ENGINEER SHALL SPECIFY SIZE AND LOCATION. SEE PROJECT ELECTRICAL ENGINEER'S DRAWINGS FOR TVSS SPECIFICATION AND LOCATION. TVSS MAY BE DELETED IF SUITABLE PROTECTION PROVIDED ELSEWHERE WITHIN ELECTRICAL SYSTEM.



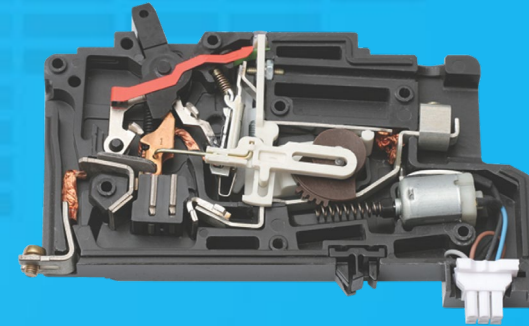
How to choose the correct electrical distribution device

A broad view of popular electrical distribution devices and the differences between them for your PRO-AVL design

Breakers vs. Relays



- Open/Closed Functionality
- Best for small systems or retrofit applications
- 30,000 cycle warranty
- Mechanically held, open air



- Provides protection to the branch
- Switches Open/Closed within the circuit breaker
- Up to 84 breakers in (1) panel
- Up to 200,000 cycle warranty
- Rated protection up to 65K AIC

Circuit Breakers versus Relays

- What equipment is currently available to you? Are you feeding your design with circuits from a power panel that is currently installed and in use?
- Will you be using equipment that needs to be electrically isolated?
- What is the interrupt rating of the current circuit breakers if you plan to re-use what is already installed?
- Do you have enough circuits to safely provide power to your design?

- What is your total power consumption for all circuits
- How many circuits do you need to power it all?
- Which of those circuits need to be controlled versus uncontrolled?
- What communication protocols are needed?
- Where will your power be coming from?

Options for an existing power panel

- Retrofitting with a Relay panel
 - Decreased installation costs
 - Installed after the current breaker panel
 - Tighter control of your equipment
 - Single protocol control vs. multi-protocol
- Put your current panel to work for you
 - Decreased costs vs. new panel
 - Sub-feeding a panel

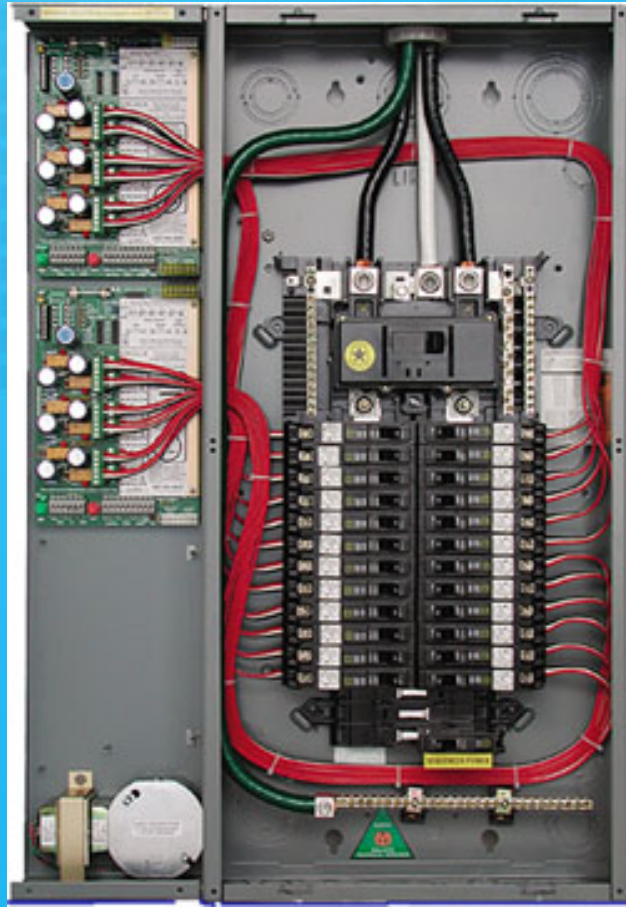
Relay panel



Panel types

- Load Centers (common in residential & light commercial applications)
 - Load Centers are smaller panelboards. Less width, depth and height
 - Loadcenters typically limited to snap in style circuit breakers
 - Typically loadcenters do not have higher than 125amp backplanes
 - Load centers are confined, by space restrictions, to a lower number of breaker slot than panelboards
 - Decreased wiring space compared to panelboard
- Panelboards
 - Common sizes: 30 space, 42 space, 54 space, 66 space, 84 space
 - Allow for bolt in style breakers that have a higher seismic rating
 - Panelboards often allow for larger amperage breaker sizes than a load center
 - Standard option of deadfront for increased safety when working on the panelboard
- *Both options can be available as main lug or main breaker config

Load Center



Panelboard

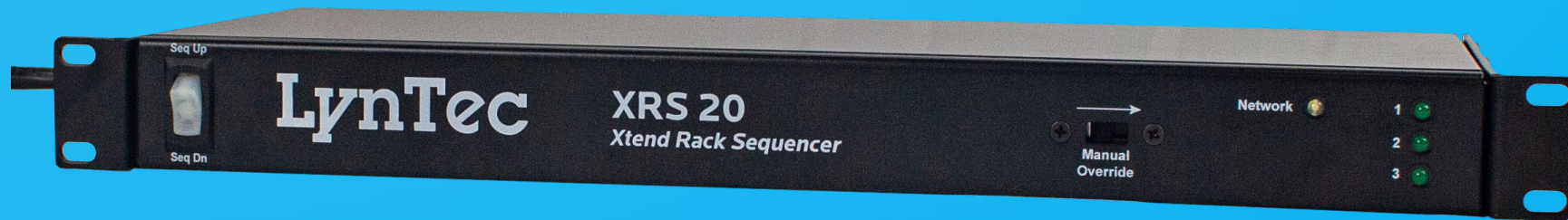


Creating zones

- What is a zone?
- Consolidating zones and/or lights (and why it's important)
- Controlling Zones
- Zones as part of an Emergency Override

Rack mounted control

- More compact control
- Front of House control vs. Electrical closet
- More affordable
- More customizable
- Often limited to 20amps per circuit



Control options

- As it was mentioned earlier, determining how many control protocols you wish to use is a secondary factor in determining what type of electrical distribution device you want to choose.
- Load centers: only choice is for 1 type of control
- Panelboards: Single Protocol versus multi-protocol



- Common types of control: Telnet/IP, Contact Closure, sACN, BacNET, DMX512, RS232, UL924 certifications for emergency lighting or override

Isolation Transformers

- Do you have a transformer in house? Is it electrically isolated? Is the current space using all the power that the current transformer can handle? Is the current transformer still meet the local electrical code?
- Aluminum or Copper Windings
- K Rating? (13) standard
- Input voltage?
- Output voltage?
- Any special rating for the enclosure I.e. outdoor rated?

