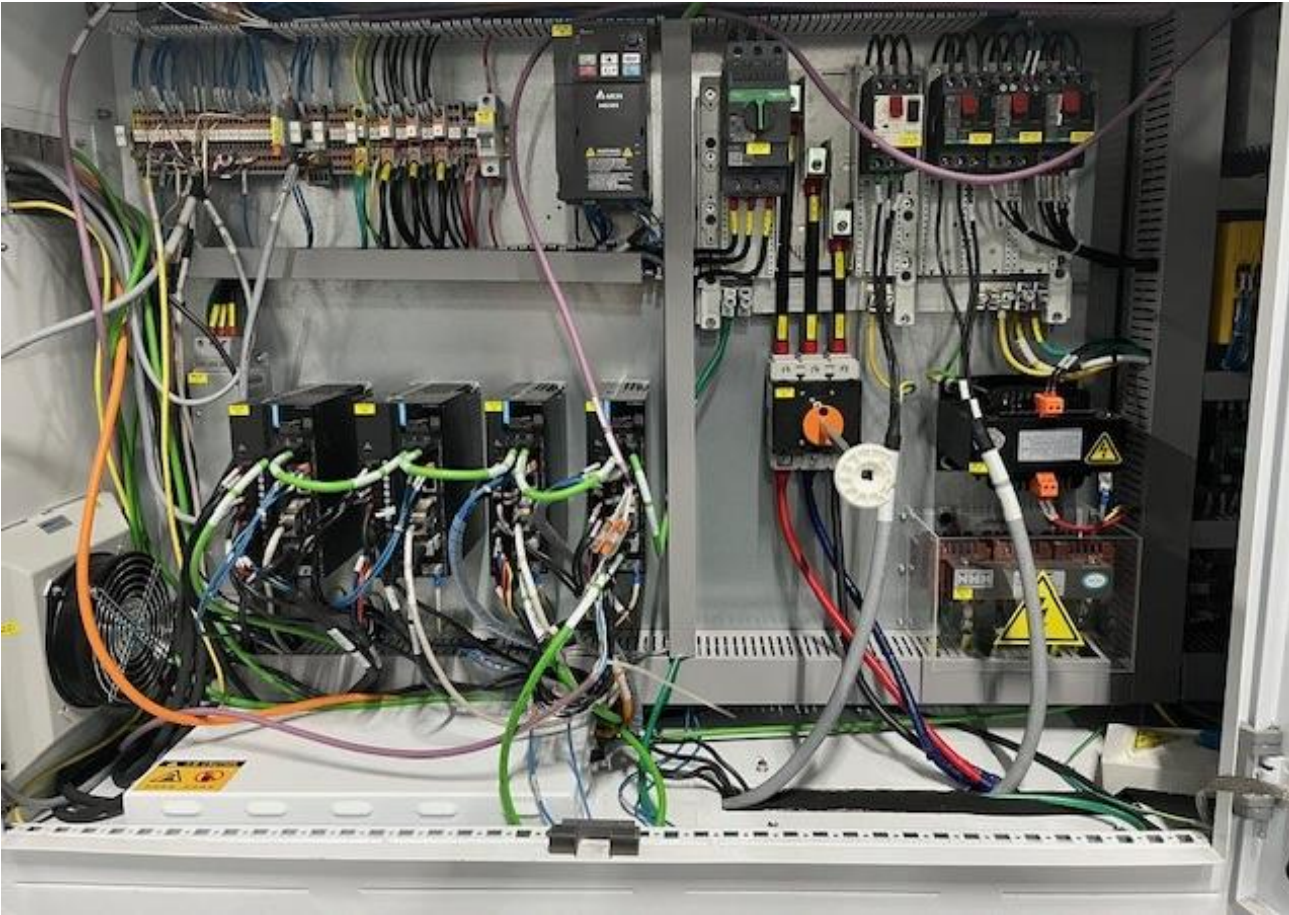
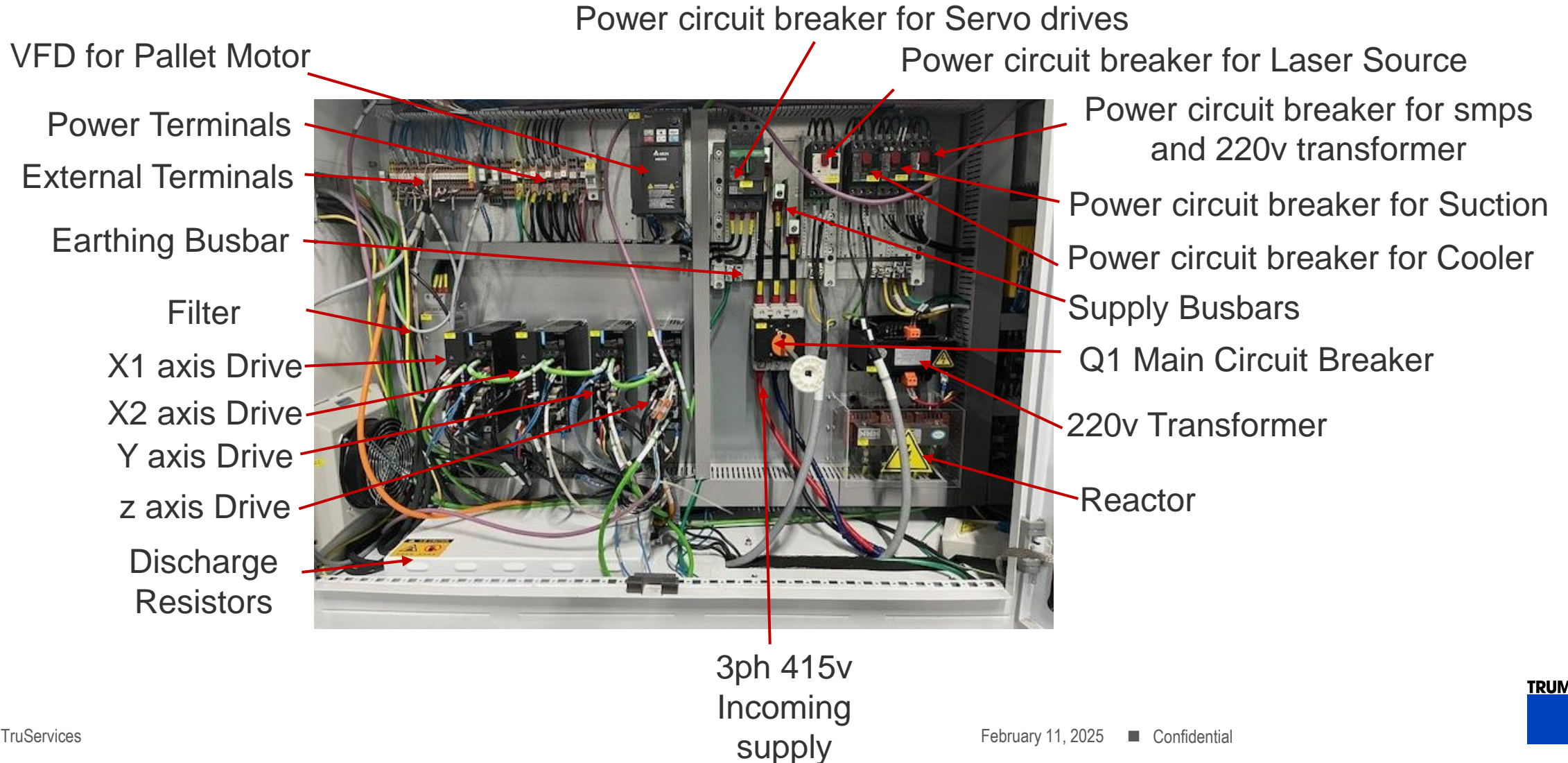


Electrical

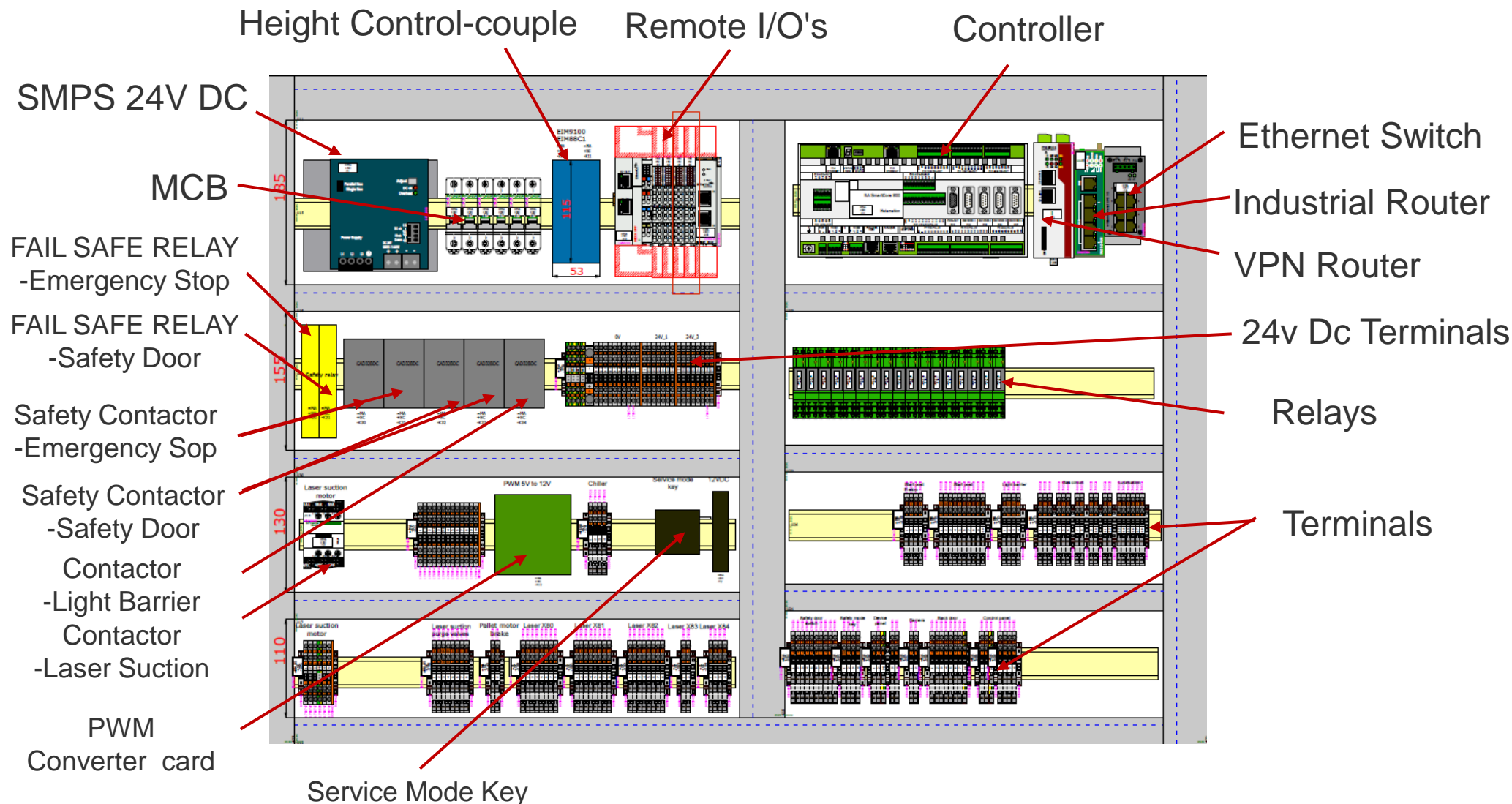


Panel Design

The Power section of the Switch cabinet Consist of the following Components



Control Section



Device Description

Main Circuit Breaker

It is a connecting point between the incoming power line and the electric control panel. It is a mechanical structure that allows an operator to connect or disconnect the electrical control panel or power system from the power line. The use or application of the main circuit breaker depends on the type of circuit breaker being used, but commonly it plays an intermediate role to protect the electric panel system from power line fault currents by automatically disconnecting the system. The power line to the main circuit breaker can be of any distribution level voltage depending on the load application.

Power Circuit Breaker

It is a connecting point between a feeder circuit breaker and a branch circuit. It is a mechanical structure that allows an operator to connect or disconnect the electrical devices from the feeding power line. The use or application of a branch circuit breaker depends on the type of circuit breaker being used, but commonly it plays an intermediate role to protect the electric devices from power line fault currents by automatically disconnecting the circuit. Some versions may also protect against thermal heat, in case a high that designed current is being drawn through the wires but not at the level of a short circuit.

Transformer or Power Supply

The electric control panel has step-down transformers that step down incoming power line voltage into the required voltage of the electric component. As the distribution line could be between 575v to 120v and the required electric voltage might be even lower than that, such as 24v, in such cases step down transformers or DC power supplies step down the voltage to the required level of the electrical control panel to run the system safely and at the levels the control devices are designed to use.

Sometimes there are multiple levels of voltages required for specific different electric equipment. In that case, multiple step-down transformers or DC power supplies get installed to supply accurate voltage to the specific electric equipment.

Device Description

Terminal Block

Terminal blocks are a fundamental electrical component of a heavy-duty electrical control panel where multiple power sources or voltage levels get required. These terminal blocks house a specific voltage power supply from where power lines get taken to the specific equipment around the electrical control panel.

Earthing

Proper Electrical grounding is critical. Follow grounding rules established in the standards and use high safety factors when able to do so. Improper grounding is among the top causes of failure of control devices

Reactor

Line reactors are electromagnetic devices used as inductors to protect variable frequency drives (VFDs) and other devices from electrical disturbances such as voltage spikes, surges, and transients. Line reactors can limit your current flow and harmful harmonics from the drive.

Filter

A line filter, also known as an EMI filter or RFI filter, is an electronic device that reduces electromagnetic interference (EMI) and radio frequency interference (RFI) in power and signal lines. Line filters are placed between the mains electricity input and the internal circuitry of electronic equipment. They help ensure that electronic equipment functions properly by transmitting pure signals

Device Description

Servo Drives

A servo drive is an electronic device that controls the speed, position, and torque of a servo motor. A servo drive receives a command signal from a control system, amplifies it, and sends it to a servo motor as an electric current. It then monitors the feedback signal from the motor and adjusts the voltage and/or current to correct for any deviations.

VFD

A variable frequency drive (VFD) is an electronic device that controls the speed of an AC motor by adjusting the frequency and voltage of the power supplied to it. VFDs are also known as inverters, variable speed drives, adjustable speed drives, adjustable frequency drives, and AC drives.

Discharge Resistors

A discharge resistor for a servo drive converts excess energy into heat and releases it into the air. This is different from an efficient servo system, which regenerates energy by returning it to the power lines. Switching from a discharge system to a regeneration system can save 30–40% on energy.

Fail Safe Relay

A fail-safe relay is a device that is designed to automatically revert to a safe state if a power loss or malfunction occurs. This helps to prevent unsafe conditions and critical failures that could lead to accidents.