



**Improving Port Safety &
Efficiency
with ERTG Connection Boxes**

Table of Context

- What is an ERTG connection box
- Environmental Benefits
- Advanced Safety Features
- Ground Fault Protection
- Push/Pull Receptacle
- Cable Design Consideration
- Optional Features
- Video Demo



What is an ERTG Connection Box

- ESL's ERTG Connection Box is Safety-interlocked, Fused Disconnect Cabinet provides safe power cord connections for Electrified Rubber Tire Gantries (ERTGs) at container terminals as well as for other medium-voltage cord-connected applications.
- Multiple ERTG cabinets can be daisy-chained, reducing the number of costly medium voltage circuit breakers required upstream in the switch gear station.
- Prevents operators from making or breaking electrical contacts under load without the need or use of kirk locks or kirk keys.



Environmental benefits

- For each gallon of diesel fuel burned, 22.38 pounds of CO₂ are produced -U.S. Energy Information Administration
- With new regulations on the horizon, diesel may soon become a relic of the past, much like steam power.



Safety Features of the ERTG Connection Box

- Interlocked 7.2kV receptacle and air-insulated load break medium voltage switch prevent connecting or disconnecting while energized
- Interlocked Grounding Switch ensures no residual voltage at the cable prior to disconnecting the ERTG plug
- Unit is ready to be wired with a redundant electric interlock switch to upstream MV circuit breaker
- MV fuses and fuse trip mechanism to ensure that all three phases are disconnected when any of the MV fuses are blown
- MV control transformer to feed all control and auxiliary Circuits



Safety Features of the ERTG Connection Box

- Cabinet window allows for safe observation of the switch's position
- Large blinking receptacle energized LED can be viewed from the ERTG operator cab
- Indicator lights – power available and tripped fuse
- Interior LED lamp allows viewing the switch status at night
- Fan-heater to prevent condensation
- Ground fault protection



What is residual energy ?

- Residual energy is the leftover energy in a system after it has completed a process.
- Once power is turned OFF to the ERTG, residual energy resides in anything with a coil. This residual energy can be deadly.
- Two approaches:
 - Let dissipate over time, but for how long?
 - Install a grounding switch to ground the de-energized phase cables.
- ESL's interlocked eRTG cabinet is designed such that the plug cannot be removed unless the switch is open, AND the ground switch is closed.



Overcurrent Protection

- Upstream – MV circuit breaker.
- The ERTG Connection Box is designed with a mechanical fuse disconnect and is configured for daisy chaining.
- Common fuse sizes are 63A, 100A and 200A.



Ground Fault Protection NEC Article 250-188

Grounding of Systems Supplying Portable or Mobile Equipment

Systems supplying portable or mobile equipment over 1000 volts, other than substations installed on a temporary basis, shall comply with 250.188(A) through (F)

Let's look briefly at 250.188(C) & (D).....



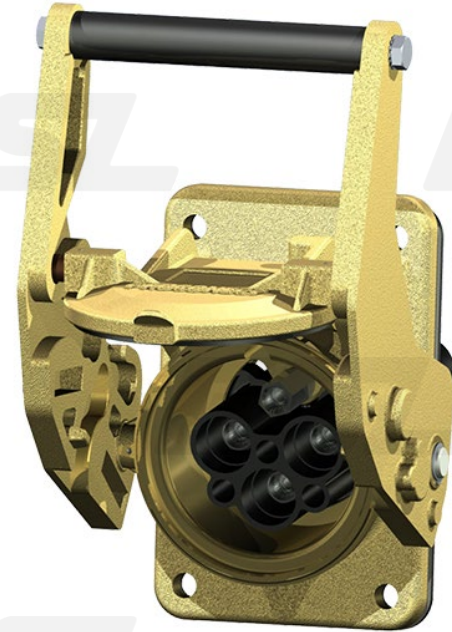
NEC Article 250-188 (C) Ground Fault Current

The voltage developed between the portable or mobile equipment frame and ground by the flow of maximum ground fault current shall not exceed
100 volts



Proconnect Plug and Receptacle

- ESL is the North America partner for Proconnect
- ESL's ERTG connection box uses the Proconnect 3PX5 push/pull receptacle.
- RTG's Cable uses a Proconnect 3PX5 series connector or equivalent.
- Proconnect's receptacle when used with ESL's mechanical safety interlock will allow for safe connection means.



CABLE DESIGN CONSIDERATIONS

- Protect the cable connection from undue stress. This can usually be accomplished through the uses of “drums” and “funnels”



Optional Features

- The Electrically Interlocked Door can be set to activate upstream Shunt Trips or Under Voltage Relays.
- Fiber Optic connections.
- Emergency Stops



Frequent Q & A

- Q1: Is there space for Stress Cones on incoming conductors?
- A1: Yes, space is provided and can be adjusted if requested.
- Q2: Max Cable Run?
- A2: No, if voltage drop occurs then the taps on the xfmr can be adjusted.
- Q3: Benefits of MV RTG vs LV RTG
- A3: MV allows for lighter and smaller diameter cable.



ESL's ERTG Cabinet



ERTG Safety-interlocked MV Disconnect Video



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Thank you for your time.

Questions ?

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