



Electrifying a Sustainable Future

Shore Power and Shipyard Solutions

Overview:

- Company introduction
- ESL's MIL-C-24368/1 (plug) and /2 (receptacle)
- Military Shore Power Safety-Interlocked Module
- Shore Power Solutions:
 - Mounds
 - Hotel stations
 - Dockside power connection station
 - Medium voltage mounds
- Shipyard Power Solutions
 - Medium Voltage disconnects
 - Power distribution and mobile isolation transformers
 - Connection Boxes
 - Portable load centers and sub hookup
 - Power Distribution Unit and Electrical Utility Station
 - 2000A Manual Bus Transfer Switch
 - 400A Load Center with Line insulation monitoring for Grounded and ungrounded power systems
 - Ground Fault Monitoring and Troubleshooting Demo Video

ESL Power Systems, Inc.

Corona, CA

- Established in 1991
- 100% Employee Owned (ESOP)
 - About 180 employees
- Production facilities - over 50,000 SqFt.
 - Fabrication facility for enclosures, brackets, panels...
 - Assembly and test facility
 - Offices in both facilities
- Fully integrated, OEM/Custom Manufacturer
- Products installed in over 64 countries
- Multiple UL files (489, 508A, 1008, 231, 891, 50...)

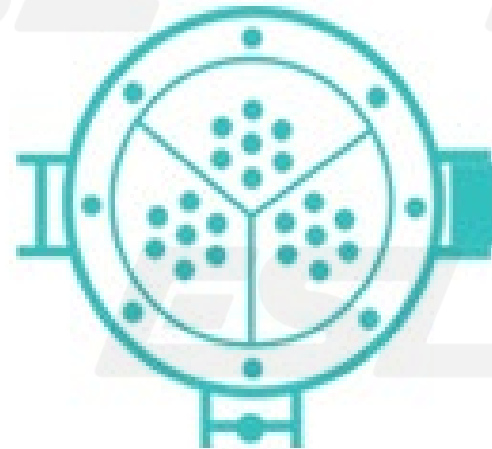
ESL designs and builds custom electrical solutions to safely connect and disconnect equipment from power.





Electrifying a Sustainable Future

Military Shore Power Solutions



Shore Power

ESL has established itself as a world leader in the design and manufacturing of safety-interlocks, including ship-to-shore power connection solutions. Our team works with customers worldwide to build custom engineered solutions for military and commercial applications such as:

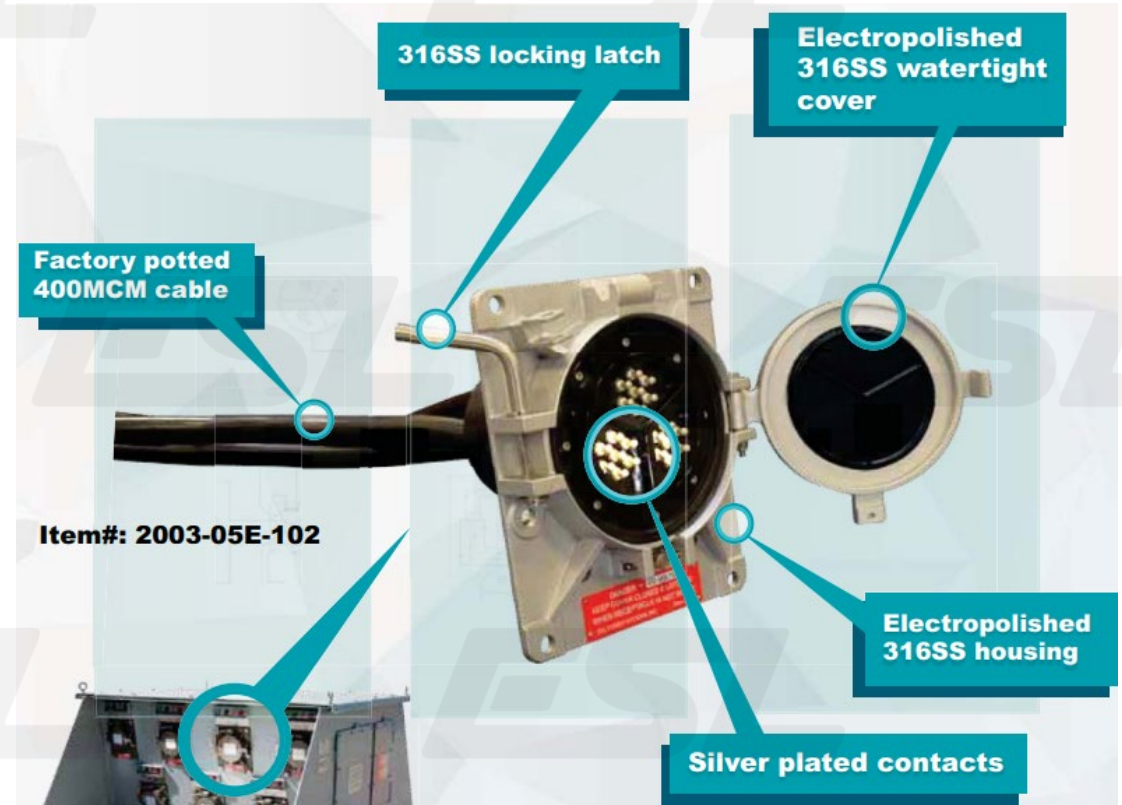
- US Navy/NATO Ships & Bases
- USCG Ships & Bases
- Container Ships & Ports
- Barges
- Yachts & Marinas
- Cruise Ship Terminals



ESL's MIL-C-24368/1 (plug) and /2 (receptacle)



Government Designation	ESL Part Number	Description
M24368/1-002	1803-00E-002	Plug
M24368/1-003	1803-00E-003	Plug + 10ft THOF-500 cable
M24368/1-003	1803-00E-003-L*	Plug + L = specified cable length



Government Designation	ESL Part Number	Description
M24368/2-101	2003-05E-101	Receptacle
M24368/2-102	2003-05E-102	Receptacle + 10 ft 400MCM cable
M24368/2-103	2003-05E-103	Receptacle + 10 ft SHOF-500 cable
M24368/2-104	2003-05E-104	Receptacle + 10 ft THOF-400 cable
M24368/2-105	2003-05E-105	Receptacle + 10 ft THOF-500 cable
M24368/2-106	2003-05E-106	Receptacle + 10 ft TSGU-400 cable
M24368/2-107	2003-05E-107	Receptacle + 10 ft TSGA-400 cable



Military Shore Power Safety-Interlocked Module



- MIL-C-24368/2 listed receptacle safety interlocked with 400A molded case circuit breaker
- Mates with MIL-C-24368/1 plug
- Simplifies installation and operation of US Navy standard MIL-C-24638/2 receptacles in shore power mounds
- Super-bright LED Lights
 - Power Available
 - Receptacle Energized
- Emergency Trip push button
- Stainless steel construction for harsh marine environment



Shore Power Mound

12-Gang Shore Power Mound

- (12) 500A, 480VAC single pole 3-phase CAM lock receptacles with microswitches
- Remote breakers indication and control capable
- 7.5kV 480: 120/240V Transformer
- Power panel and enclosed 200A circuit breaker for industrial use
- 316 stainless steel Type 3R enclosure
- Powder coated to comply with IEEE C57.12.28



Shore Power Hotel Station



8-Gang Shore Power Hotel Station

- (8) single pole receptacle with microswitches, 4000A @ 480VAC
- 316 stainless steel Type 3R enclosure
- Powder coated to comply with IEEE C57.12.28
- Remote breakers indication and control



Dockside Power Connection Station

10-Gang Dockside Power Connection Station



- (10) MIL-C-24368/2 receptacles 500A 500VAC
- 10GA Type 304 or 316 stainless steel Type 3RX (vented or 4X (sealed) enclosure
- Powder-coated exterior finish to meet IEEE C57.12.28/.29
- Integrated fiber optic, cable TV, and telephone connections
- 3 Phase 200A 480VAC safety interlocked auxiliary power port



Military Shore Power – Navy

6-Gang MIL-C Shore Power Assembly

- (6) ESL 400A 480VAC ESL MIL-C-24368/2 safety-interlocked modules, each with:
 - Electrically-interlocked 400A circuit breaker
 - LED indicators for
 - Power Available
 - Receptacle Energized
 - Emergency-stop push button
 - (1) Industrial 200A 480VAC ESL safety interlocked power module
- 10GA Type 304 stainless steel, powder-coated enclosure



Medium Voltage Shore Power Mounds



4-Gang Medium Voltage Power Mound

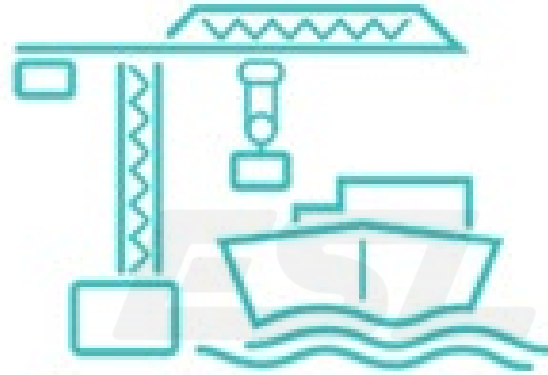
- (4) 500A 4160VAC receptacles with trapped key interlock
- 12GA Type 304 or 316 stainless steel Type 3RX
- Powder coated to comply with IEEE C57.12.28
- Remote breakers indication and control





Electrifying a Sustainable Future

Shipyard Power Solutions



Medium Voltage Disconnects

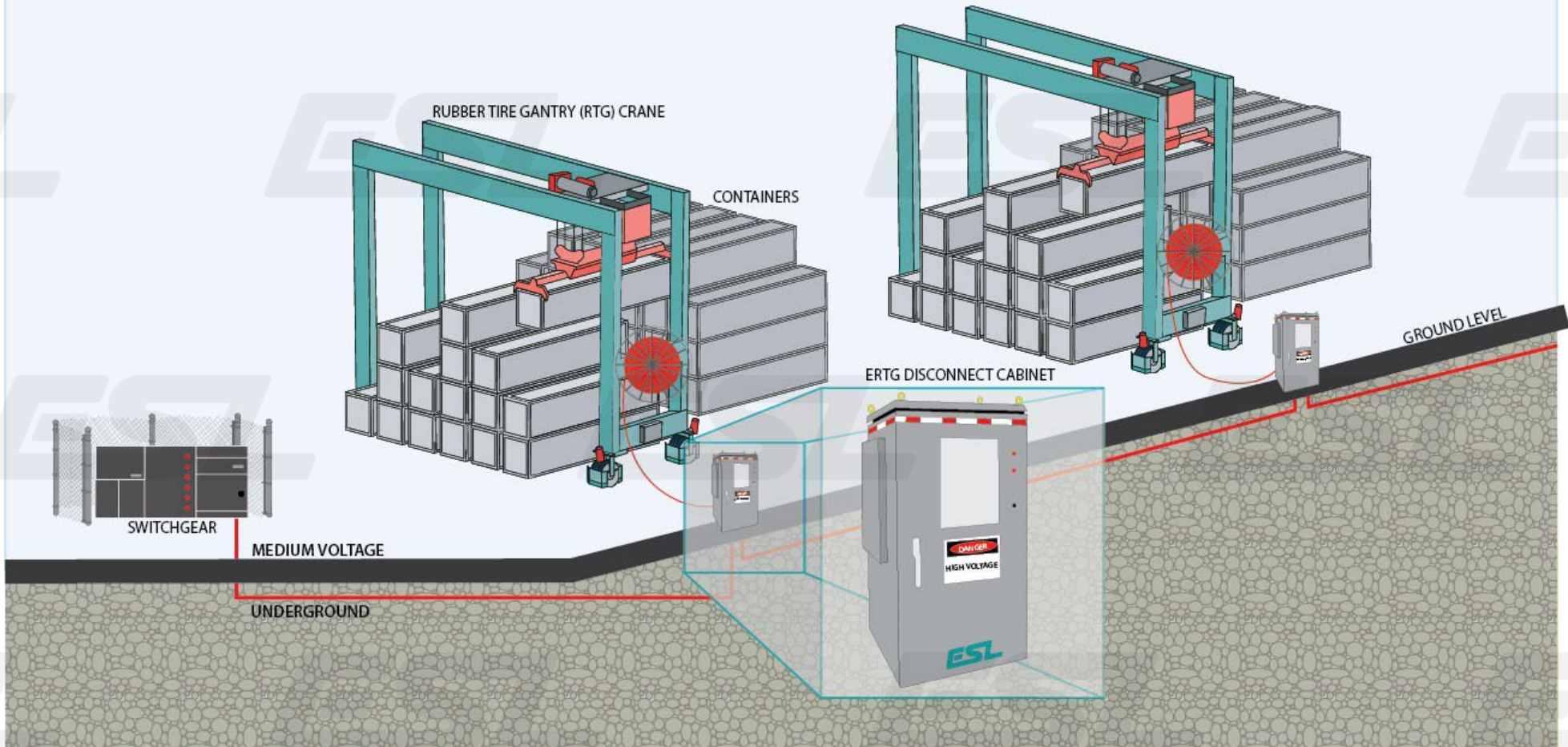
Safety-interlocked Fused Disconnect Cabinets:

- 10GA/12GA 304 stainless steel construction
- Common voltages: 4160 V 60Hz
- Medium voltage allows for lighter cable and longer runs
- Compact footprint minimizes obstructions in the yard
- Daisy-chaining several disconnect cabinets
 - Minimizes the number of MV circuit breakers required
 - Reduced space required
 - Reduced cost



Medium Voltage Disconnect Cabinet Daisy Chaining

ERTG Safety-interlocked Fused Disconnect Cabinet
(Port Terminal Connection Diagram)



Portable Shore Power and Submarine Hook-ups



5200-02
Industrial Outlet Assembly



5200-01B
Sub Hook-ups



Portable Connection Boxes



5201-43-US
2000A 480VAC
Connection Box with Breaker



5201-119-US
4000A 480VAC
Connection Box with Breaker



5101-54-US
4000A 480VAC
Connection Box



Power Distribution Unit and Electrical Utility Stations



6100-51B-WES

400kVA Iso Transformers



2214-05D

Electric Utility Station



Shore Power Manual Bus Transfer Unit



- Manual Bus Transfer (MBT) Unit (480VAC, 2000A):
 - Inputs:
 - (5) Cam Plates Shore Power
 - (3) Cam Plates Portable Generator inputs
 - Manual Transfer Switch
 - (2) 2000A mechanically interlocked
 - Power Output:
 - (5) MIL-C-24368/2B receptacles with individual 400A circuit breakers
 - Enclosure
 - 12GA, 304 SS Type 3RX



Portable Load Centers & Handheld GFCI Distribution



6100-54

200A Portable Distribution Load Center



6100-53

400A Distribution Load Center



5100-160

50A 120VAC
6 Gang GFCI Assembly



6100-53 400 Amp Distribution Load Center



Features:

- Input Power: 480VAC, 400A – CAM lock
- Output Power:
 - 6 three phase 480VAC, 50A – 4FR60
 - 3 single pole 600VAC, 200A - 3-phase cam locks
 - 8 single phase 120VAC, 50A – 3FR50
- All inputs & outputs equipped with circuit breakers
- Input power monitoring display
- Ground-fault monitoring and locating for grounded and ungrounded 480VAC circuits

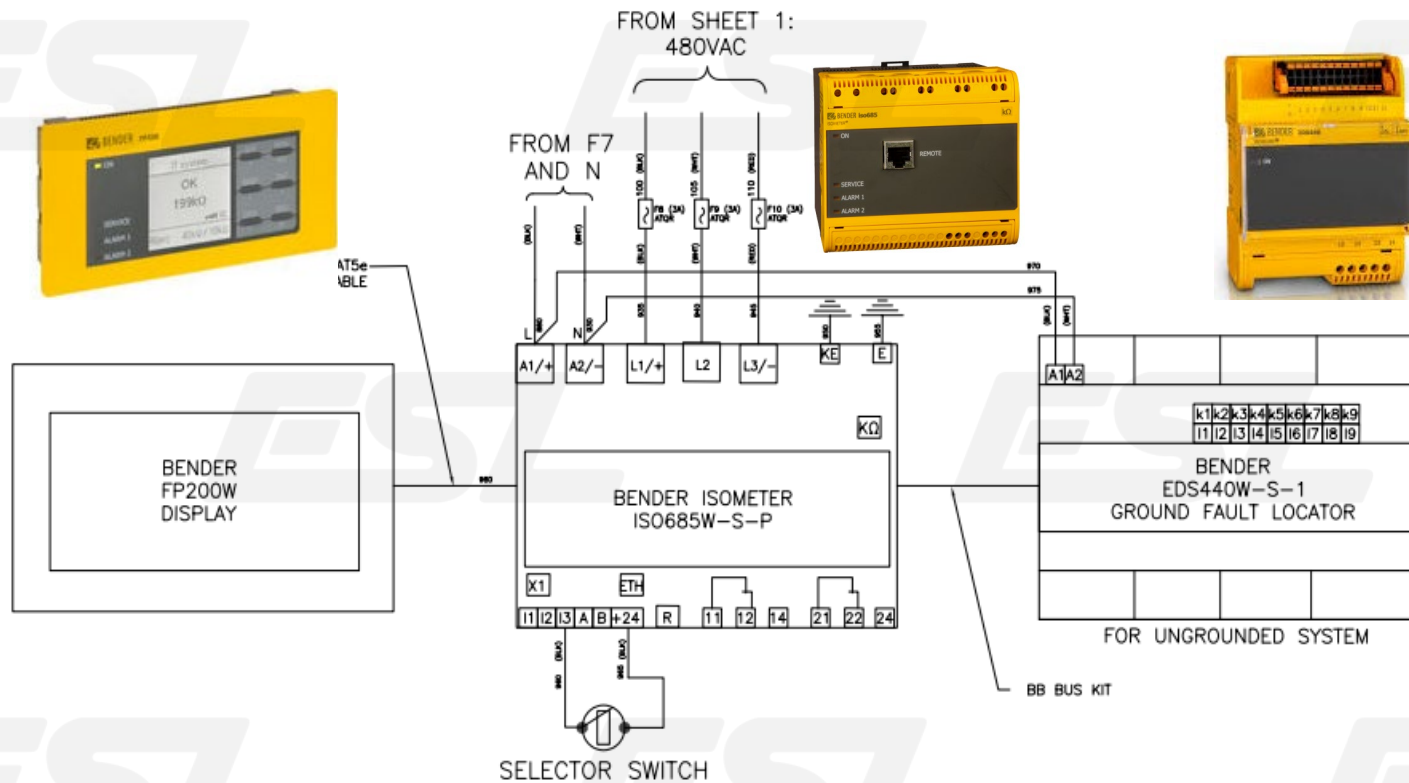




Ground-Fault Monitoring and Locator

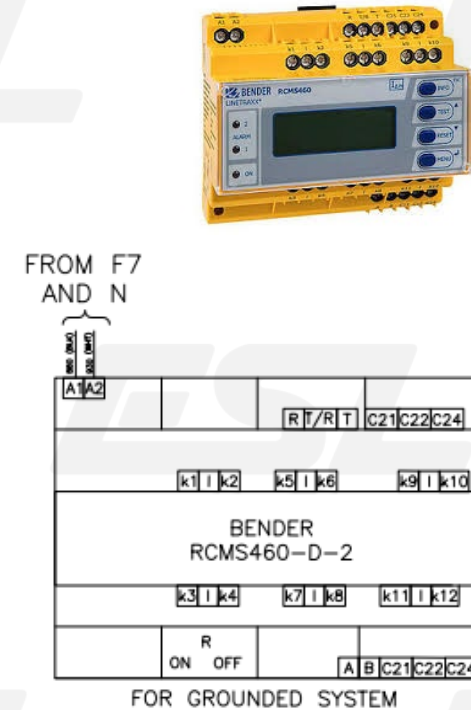
Insulation Resistance Monitor and Ground Fault Locator for Ungrounded Power Systems

Insulation Resistance Monitor and Ground Fault Locator for Grounded Power Systems



ZERO SEQUENCE CT
WIRE CONNECTION:

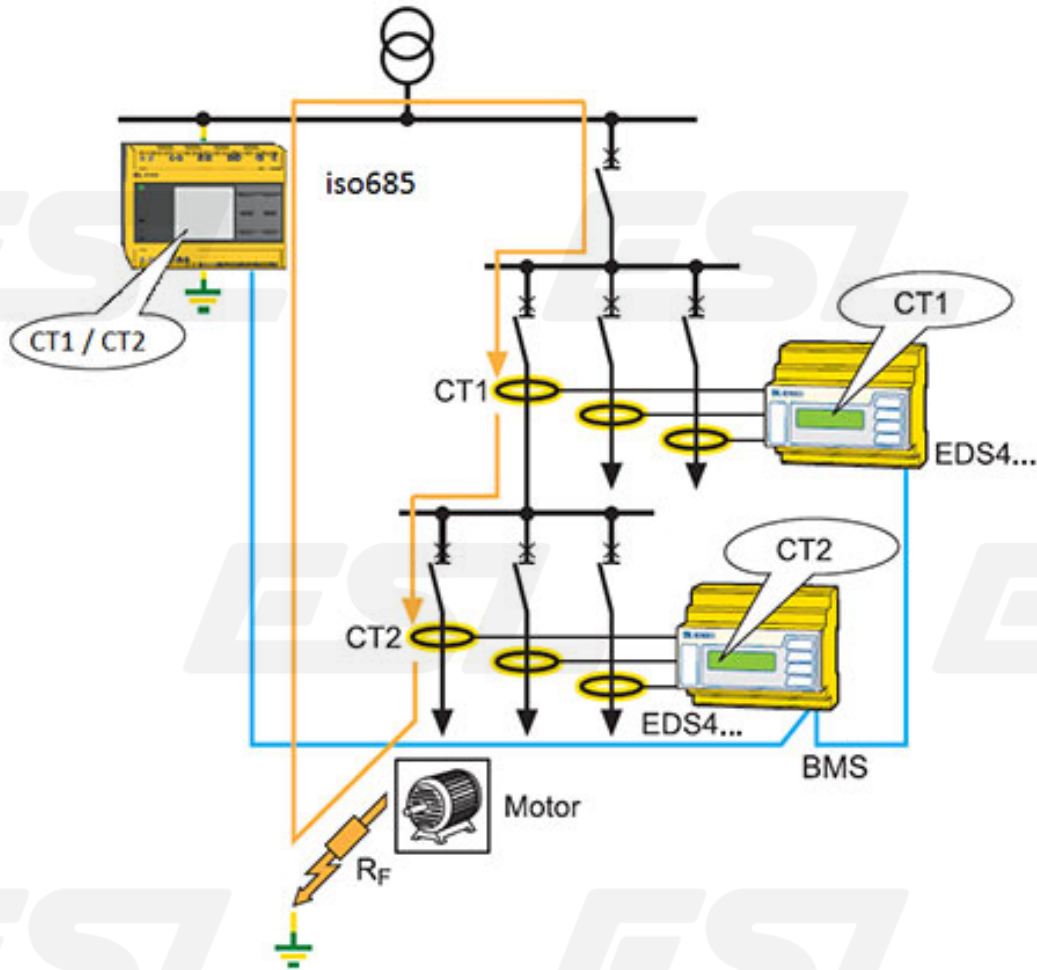
R1 = I1 + K1
R2 = I2 + K2
R3 = I3 + K3
R4 = I4 + K4
R5 = I5 + K5
R6 = I6 + K6
R7 = I7 + K7
R8 = I8 + K8
R9 = I9 + K9



ZERO SEQUENCE CT
WIRE CONNECTION:

R1 = I1 + K1
R2 = I2 + K2
R3 = I3 + K3
R4 = I4 + K4
R5 = I5 + K5
R6 = I6 + K6
R7 = I7 + K7
R8 = I8 + K8
R9 = I9 + K9

Ungrounded Power System Ground-Fault Monitoring and locating



- Bender ISO685
 - fault detection for ungrounded power systems
 - Minimizes unplanned outages
 - Proactive maintenance planning
 - Enhanced safety
- Bender EDS-440W
 - Integrates with ISO685 IR unit
 - Fault location without disconnecting electrical system
 - Reduced maintenance costs
 - Increased operating reliability



***ESL* Power Systems, Inc.**

Your partner in providing safe, dependable and
custom engineered electrical solutions.

Thank You for your input and ongoing suggestions for
enhancing our product lines and on how we can provide better
customer assistance for you.

Erika Thorson

Email me at: ethorson@eslpwr.com

