ERMATECH GROUP

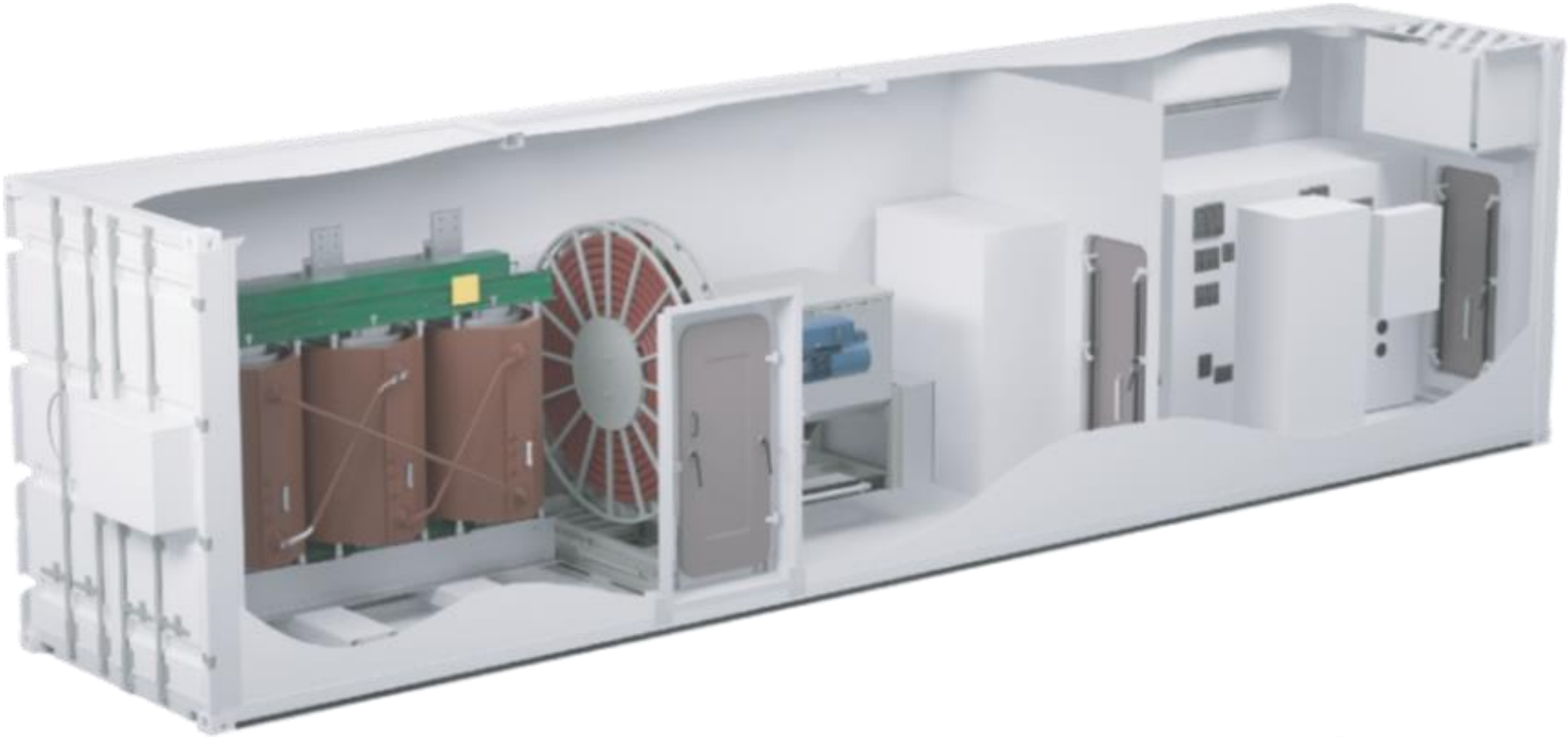
From saving the oceans.
To safeguarding the planet.

ERMA FIRST BLUE CONNECT

Alternative Maritime Power (AMP)

WWW.ERMATECHGROUP.COM

BLUE CONNECT –
ALTERNATIVE MARINE POWER



ERMATECH GROUP

ERMA FIRST BLUE CONNECT

Alternative Maritime Power (AMP)

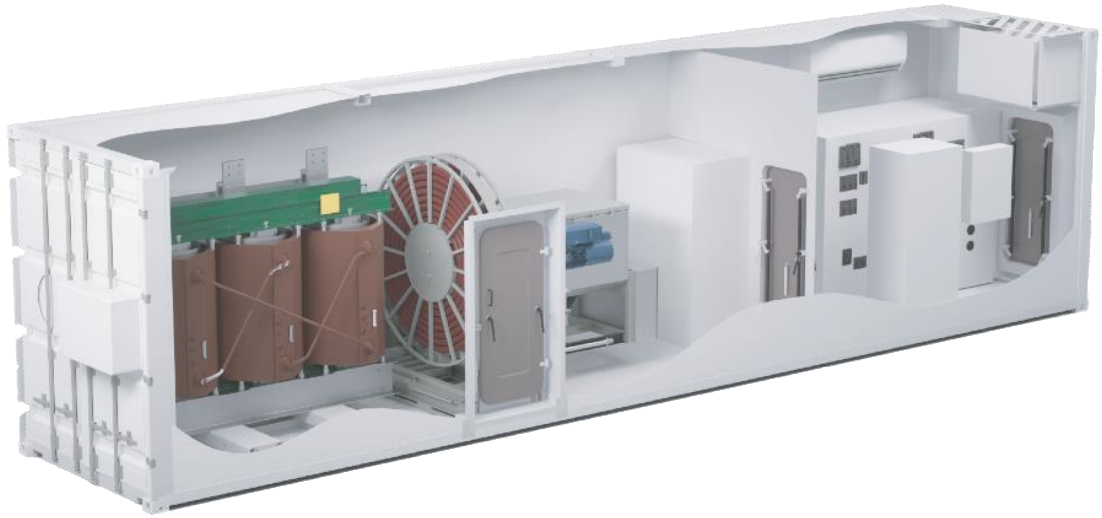
RIGHTSHIP ZERO HARM INNOVATION PARTNERS 2024

DECARBONISATION

BLUE CONNECT is the Shore Power solution designed and offered by **ERMA FIRST**.

Shore Power is the connection of the vessel to the port's electrical grid in order to power onboard systems and equipment. This enables the vessel's diesel generators to be switched off with a resultant reduction in noise and emissions, including particulate matter, nitrogen, sulphur and carbon oxides, and volatile organic compounds.

Vessels with power demands higher than 1MVA must establish High Voltage Connections (6,6kV or 11kV) with the Port power grid, implementing suitable equipment according to international regulations and ports requirements.



ACHIEVES REGULATORY COMPLIANCE, IMPROVES CII INDEX, REDUCES GHG INTENSITY

- Advanced engineering
- Turnkey approach
- FuelEU and CARB compliant - Zero air emissions at berth
- Reducing OPEX and maintenance costs
- Improving port's microclimate and seafarers' working conditions

DNV
Recognized as an ESD
for its positive impact on CII performance

BV
Approval in Principle
(AiP)

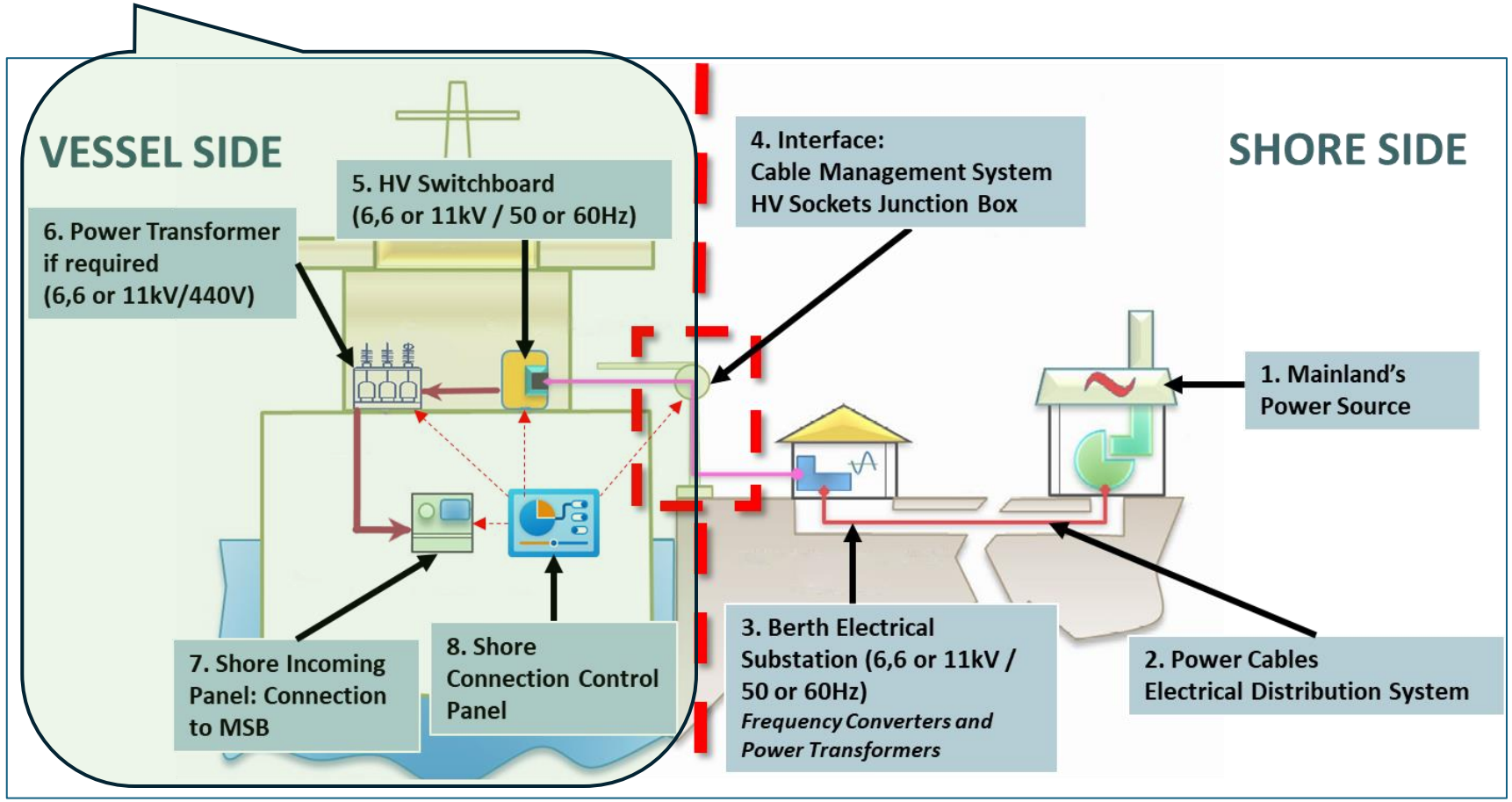
AVAILABLE FOR: Ro-Ro/Ro-Pax, PCTC, Ferries, Containers, Cruise, Tankers

From saving the oceans. To safeguarding the planet.

ERMA FIRST ERMATECH GROUP

BLUE CONNECT:
THE SUSTAINABLE SOLUTION AT PORT

BLUE CONNECT is ERMA FIRST's integrated on-board solution, that allows vessels to cover the energy demands while at berth, shutting down their aux. engines and plugging in an on-shore electrical power source while at berth.



BLUE CONNECT AMP is designed in line with the industry standards and best practices, to ensure safety, reliability, flexible installation, ease of operation and regulatory compliance.

- Cold ironing
- Shore Side Electricity (SSE)
- High Voltage Shore Connection (HVSC)
- Onshore Power Supply (OPS)
- **Alternative Maritime Power (AMP)**

ERMATECH GROUP

ALTERNATIVE MARITIME POWER: REGULATORY LANDSCAPE

2021

CHINA
CCS – Technical Notice No.57/Total No.383 & Article 10/11 of Port and ship shore power management Policy

2022

USA/CARB
Container, reefer and cruise vessels are already covered through 2022 by the regulation.

2025

USA/CARB
Coverage under the new regulation in 2025 Tankers for Los Angeles and Long Beach

2027

USA/CARB
Tankers for Northern California

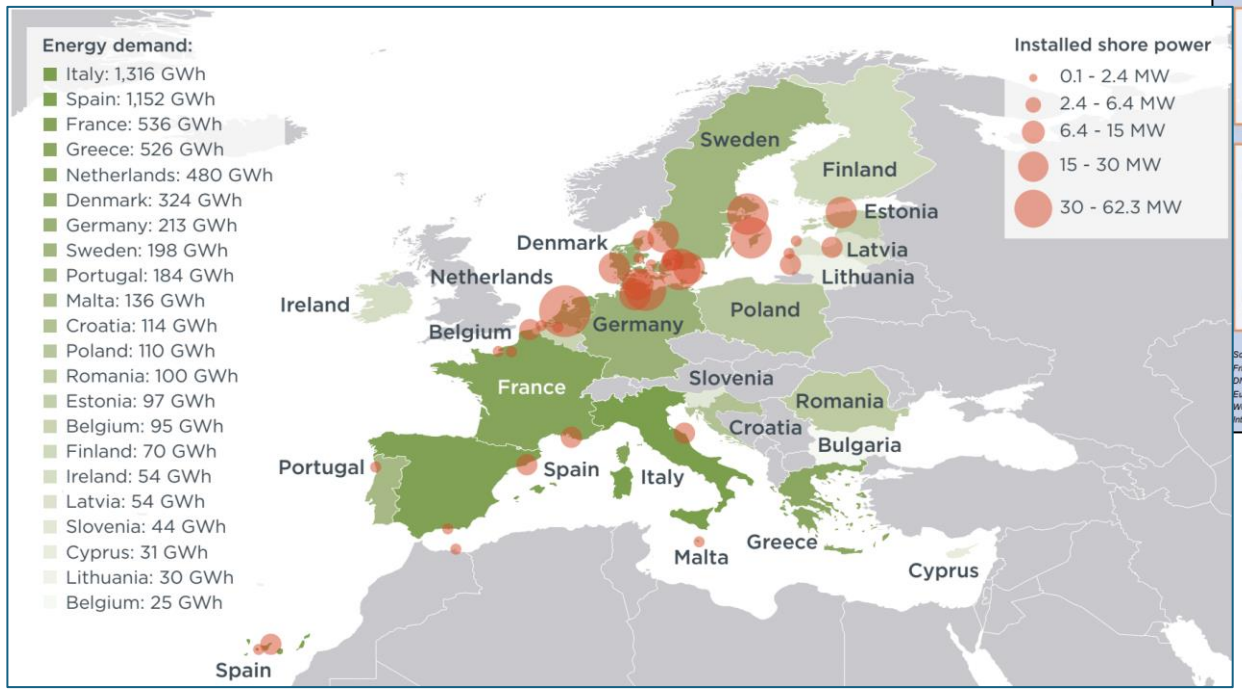
2030

European Commission
FuelEU Maritime Regulation Article 5 : Additional zero-emission requirements of energy used at berth

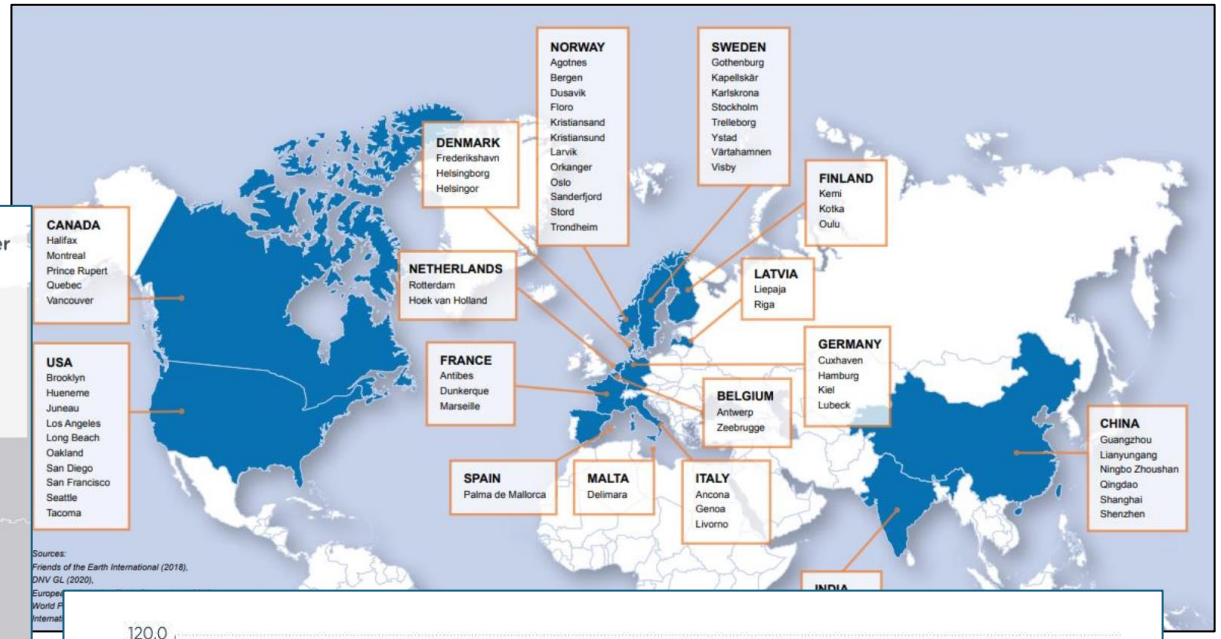
From saving the oceans. To safeguarding the planet.

ERMATECH GROUP

HIGH VOLTAGE OPS FACILITIES



At-berth energy demand of ships by EU Member State and available existing power installations in EU ports.



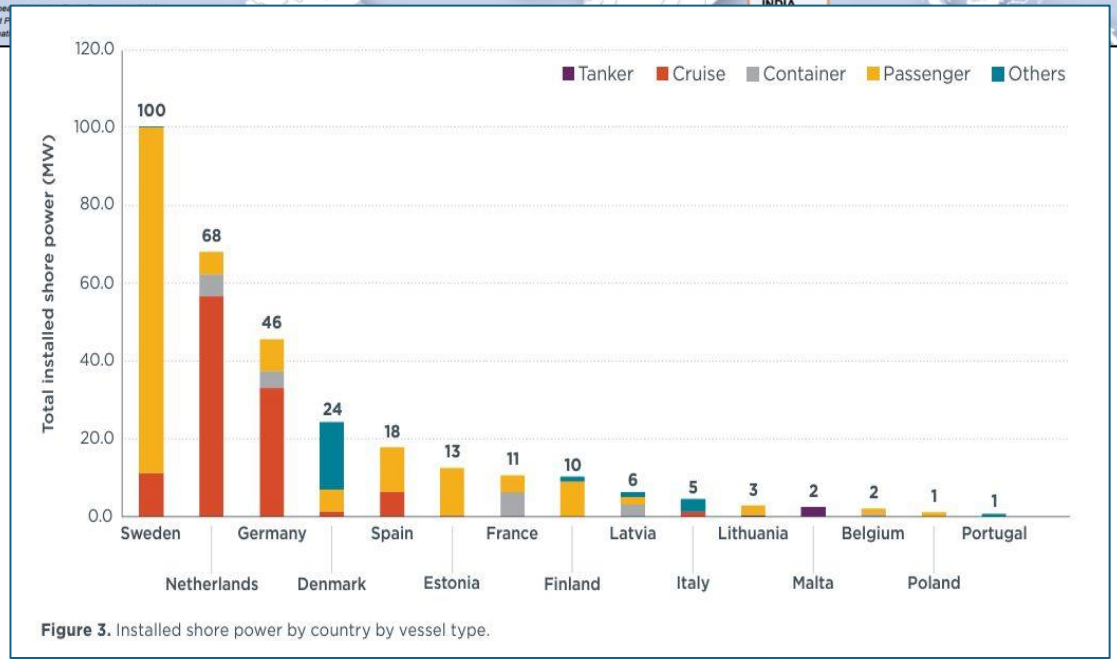


Figure 3. Installed shore power by country by vessel type.

- **Port of Gothenburg and Port of Gavle** are installing Shore power for **tankers** in cooperation with Danish owners.
- **Rotterdam** has an ongoing project to supply shore power for **tankers**.

ERMATECH GROUP

STANDARDISATION - REGULATIONS

DRIVERS

- Safety
- Voltage Level
- Shore-Ship Interface
- Monitoring and Control
- Compatibility

IEC / ISO / IEEE 80005-1:2019-03
High Voltage Shoreside Connection (HVSC)

→ ***Regulations for large vessels***
Container ships, cruise vessels Tankers, LNGC, PCTC & Ro-Ro >1MVA up to 20MVA

IEC / ISO / IEEE 80005-2:2016-06
Communication Protocol

→ ***Regulations for shore***
Vessel communication protocol for remotely operated shore connection

IEC / ISO / IEEE 80005-3:2016-06
Low Voltage Shoreside Connection (LVSC)

→ ***Regulations for small vessels***
Large fisheries, river cruise ships, offshore supply vessels, etc. <1MVA

IEC 62613-1:2019

→ ***Plugs, socket outlets and ship couplers for high voltage shore connection (HVSC) systems***
Part 1: General requirements

IEC 62613-2:2016

→ ***Plugs, socket outlets and ship couplers for high voltage shore connection (HVSC) systems***
Part 2: Dimensional compatibility and interchangeability requirements for accessories to be used by various types of ships

ABS

→ Guide for "*High Voltage Shore Connection*"

Bureau Veritas

→ Guide for "*High Voltage Shore Connection System*"

DNV

→ RULES FOR CLASSIFICATION SHIPS (Part 6 Additional class notations, Chapter 7 *Environmental protection and pollution control, Section 5 Electrical Shore Connections* (edition July 2019).

Lloyd's Register

→ Rules and Regulations for the Classification of Ships, Other Ship Types and Systems – *Onshore Power Supplies*

Class NK

Guidelines for "*High-Voltage Shore Connection System*"

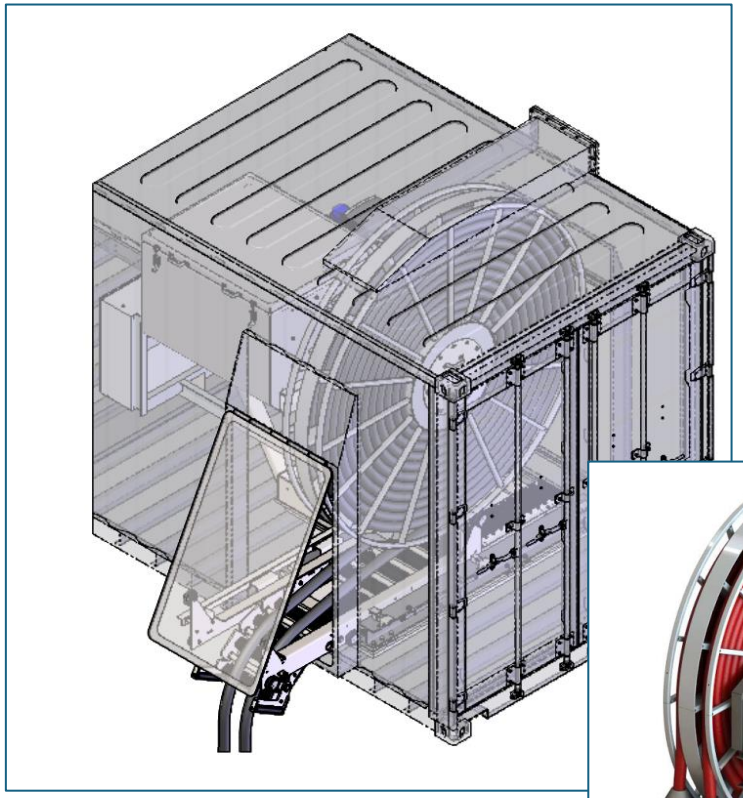
ERMATECH GROUP

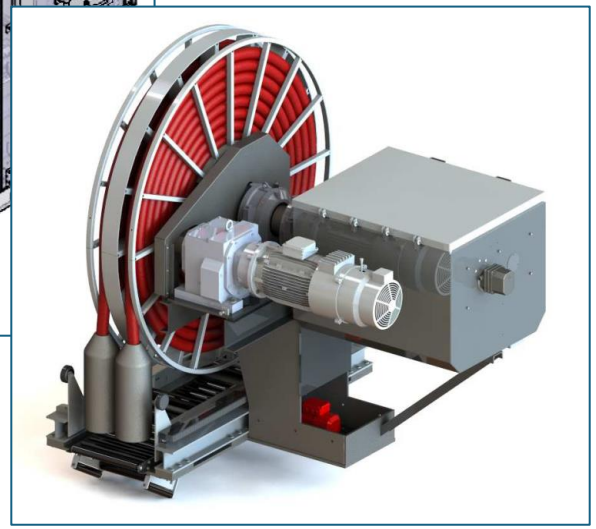
HV SHORE CONNECTION BASIC DESIGN per SHIP TYPE vs STANDARDS

Characteristics		Ship Types					
		CONTAINERSHIP	RO-RO / RO-PAX	VEHICLE CARRIER	CRUISE	TANKER	LNGC
Voltage/ Frequency	:	6.6 kV AC 50 or 60 Hz	11 kV AC [6.6 kV in regional] 50 or 60 Hz	11 kV AC 60 Hz	6.6 and/or 11 kV AC 50 or 60 Hz	6.6 kV AC 50 or 60 Hz	6.6 kV AC 60 Hz
Max Power Requirements	:	Up to 7.5 MVA	Up to 6.5 MVA	Up to 6.5 MVA	16 to 20 MVA	Up to 7.5 MVA	Up to 10.7 MVA
Shore Connection Interface ON BOARD	:	Cable Management System & 62613-2/Annex I	Plugs 62613-2/Annex J	Plugs 62613-2/Annex J	Plugs @ 500A each 62613-2/Annex G/H	Plugs 62613-2/Annex I	Plugs 62613-2/Annex J
No and Type of Cables	:	2 x (3P + E + 3 Pilots + FO)	1 x (3P + E + 7 Pilots + FO)	1 x (3P + E + 7 Pilots + FO)	4 x (3P + E + 1 Pilot) + Neutral + Controls	3 x (3P + E + 3 Pilots) @ 3.6 MVA each	3 x (3P + E + 7 Pilots + FO)
Layout	:	Fixed & Portable	Fixed	Fixed	Fixed	Fixed	Fixed
Design	:	Containerized mostly	Stand alone	Stand alone	Stand alone	Stand alone	Stand alone
Standard	:	IEC/IEEE 80005-1/Annex D (Normative)	IEC/IEEE 80005-1/Annex B (Normative)	IEC/IEEE 80005-1/Annex G (Normative)	IEC/IEEE 80005-1/Annex C (Normative)	IEC/IEEE 80005-1/Annex F (Informative)	IEC/IEEE 80005-1/Annex E (Informative)

<1MVA: Low Voltage Shore Connection [380/440/690 V] per IEC/IEEE 80005-3

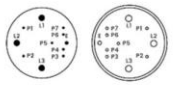
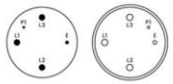
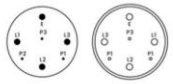
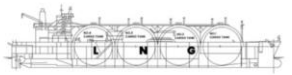
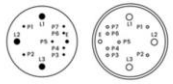
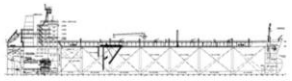
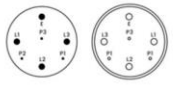
THE EQUIPMENT:
CABLE MANAGEMENT SYSTEM





Parameter	Unit		CABLE MANAGEMENT SYSTEM	
ID	-	:	CMS-SC	
Type	-	:	Motorized Cable Reel	
Rated Voltage	kV	:	10kV: Power Slipring insulation voltage	
Rated Operating Voltage	kV	:	6.6	
Rated Frequency	Hz	:	60	
Rated Power	MVA	:	Up to 7.5	
Rated Current	A	:	800	
Rated Short-Time Withstand Current (1sec) /Arc Test Current (acc IEC62271)	kA	:	16	
Auxiliary Power Supply	V	:	230/450 AC	
Air Humidity (on 24h)	%	:	up to 100%	
Ambient Air Temerature	degC	:	-2 to 45	
IP Class	-	:	IP55	
Dimensions CMS / w Enclosure [LxWxH]	-	:	2987 x 2210 x 2550	~ 3800 x 2900 x 3200
Weight	-	:	3700	~ 5000
Reel Cable	-	:	3x185 + 1x95/2 mm^2 +(5x2,5)C+ 12x62.5/125 µm	
Number of cables	-	:	2	
Number of Pilots	-	:	10	
Cable Length	m	:	35	
Winding speed	-	:	Max: 12m/min	
Limit Switches	-	:	2	
Reel body Material	-	:	Hot- dip Galvanized	
Slipring housing material	-	:	Stainless steel 1.4301	
Drive	-	:	three-phase asynchronous motor with a chain drive	
Heater	-	:	Included	
Plugs	-	:	Male, PC5 push-pull, with 3 poles + earth / 3 pilots. Max current/phase: 350A. Rated Voltage: 7,2kV	

THE EQUIPMENT: SOCKET JUNCTION BOX

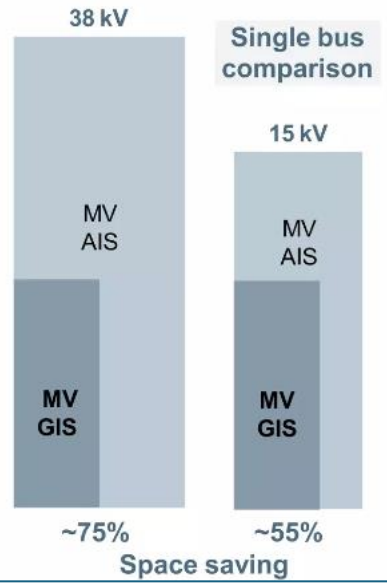
High Voltage > 1 MVA	Operability	Dimensions	Plug
 Ro-Ro cargo and Ro-Ro passenger ships	80005-1 **Annex B** Normative	62613-2 **Annex J**	
 Cruise ships	80005-1 **Annex C** Normative	62613-2 **Annex G/H**	
 Container ships	80005-1 **Annex D** Normative	62613-2 **Annex I**	
 LNG carriers	80005-1 **Annex E** Informative	62613-2 **Annex J**	
 Tankers	80005-1 **Annex F** Informative	IEC 62613-2 **Annex I**	
Other	80005-1 Not defined	62613-2 As appropriate	Not defined

Parameter	Unit		SOCKET JUNCTION BOX
ID	-	:	SJB.2
Type	-	:	Receiving Socket Box
Rated Voltage	kV	:	7.2
Rated Operating Voltage	kV	:	6.6
Impulse withstand voltage (1.2/50µsec)	kV	:	50
Rated Current	A	:	2x 350
Rated Short-Time Withstand Current (1sec)	kA	:	16
Auxiliary Power Supply	V	:	440V/60Hz/63^{A}
Dimensions [LxWxH]	mm	:	1276 x 891 x 1275
Weight	kg	:	90
IP Class	-	:	SJB: IP55 / Socket: IP66
Paint/Finishing	-	:	Metallic, stainless steel
Standards	-	:	IEC 62613-2:2016
Aux Equipment:	-	:	heating system with thermostat, emergency stop push button, medium voltage isolator

THE EQUIPMENT: HIGH VOLTAGE SWITCHGEAR

Compact Footprint – Air Insulated Switchgear (AIS) vs Gas Insulated Switchgear (GIS)

Footprint comparison (MV AIS & MV GIS - only equipment size considered)

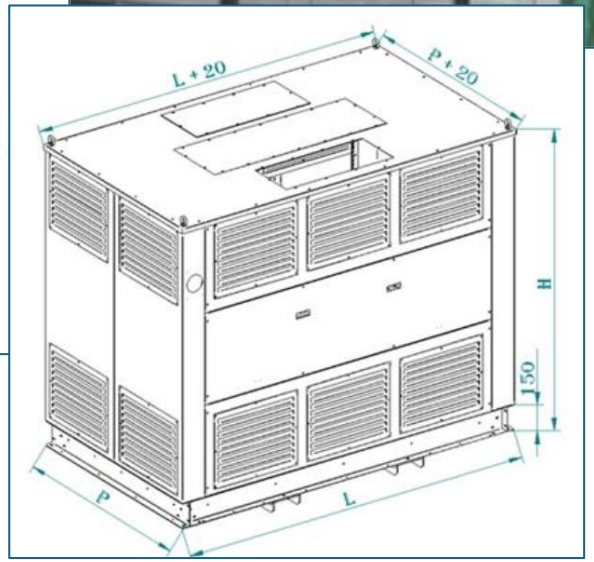


Parameter	Unit		HV SHORE CONNECTION PANEL	HV SHORE CONNECTION & CHANGE OVER PANEL
ID	-	:	HVSCP	HVSCHP
Type	-	:	switchgear is a maintenance-free, factory-assembled and type-tested medium-voltage switchgear. It is three-pole metal-enclosed and designed with SF6-insulation.	
Type of apparatus	-	:	1x Three-Position Switch-Disconnector, 1x Vacuum Circuit breaker	2x Three-Position Switch-Disconnector, 1x Vacuum Circuit breaker
Internal Arc Classification (IAC)	-	:	IAC A FLR 25 kA 1s	
Rated Voltage	kV	:	12	
Rated Operating Voltage	kV	:	11	
Rated Frequency	Hz	:	60	
Rated Power Frequency Withstand Voltage (1min)	kV	:	28	
Rated lightning impulse withstand voltage	kV	:	75	
Rated continuous current	A	:	800	
Rated short-circuit breaking current	kA	:	25	
Rated Short-Time Withstand Current (1sec) / Rated peak withstand current	kA	:	25/65	
Auxiliary Power Supply	V	:	24 DC	
Ambient Air Temerature	degC	:	-5° /+55°	
Dimensions [WxDxH]	mm	:	1154 x 1225 x 2250	1604 x 1225 x 2250
IP Class	-	:	IP65 (for live parts of the primary circuit) / IP31D (for the switchgear enclosure)	
Paint	-	:	RAL7035	
Standards	-	:	IEC 62271-200	

Siemens GIS NXPlusC circuit-breaker panel

ERMATECH GROUP

THE EQUIPMENT: POWER TRANSFORMER



Parameter	Unit		POWER TRANSFORMER
ID	-	:	25TR
Type	-	:	Dry Type Transformer
Model	-	:	EFBC/HART180
Cooling	-	:	AN
Rated Primary / Secondary Voltage	kV	:	11 / 0.44
Rated Frequency	Hz	:	60
Rated Power	KVA	:	4000
Primary Voltage Tappings (at no load)	-	:	±2 x 2,5%
Primary Insulation Level	kV	:	20
Secondary Insulation Level	kV	:	3
Number of Phases	-	:	3
Vector Group	-	:	Dyn11
Primary / Secondary winding conductor material	-	:	AL / AL
Primary / Secondary winding insulation method	-	:	Cast Resin / Impregnated
Ambient Air Temerature	°C	:	-25 to +45
Insulation Temperature Class	-	:	H/H
Environmental / Climatic / Fire classes	-	:	E4/C3/F1
Dimensions [LxDxH]	mm	:	2490 x 1310 x 2445
Weight	kg	:	8900
IP Class	-	:	IP00 / IP23
Bi-directional rollers	QTY	:	4
Lifting lugs and pulling eyes	QTY	:	4
Earthing terminals	QTY	:	2
PT100 probes	QTY	:	3
TMU (Temp. Monitor Unit)	QTY	:	1
Set of Antivibration Pads	QTY	:	1
Set of Anticondensation heaters	QTY	:	1

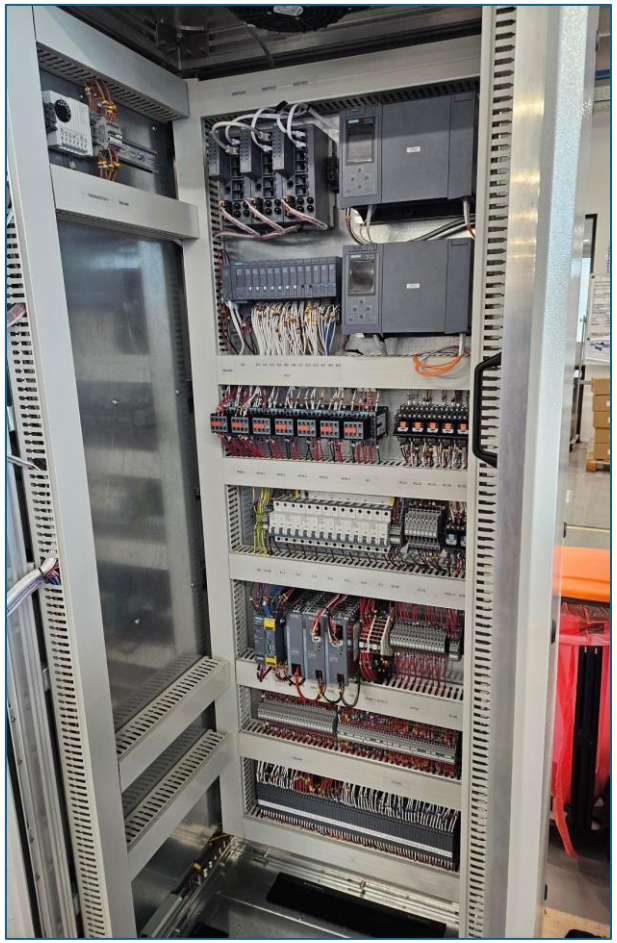
GEAFOL Transformers Transformers Siemens Global Website

TRANSFORMADOR TRIHAL - IP00 - CONEXIONES

TMC Transformers - Details make the difference.

ERMATECH GROUP

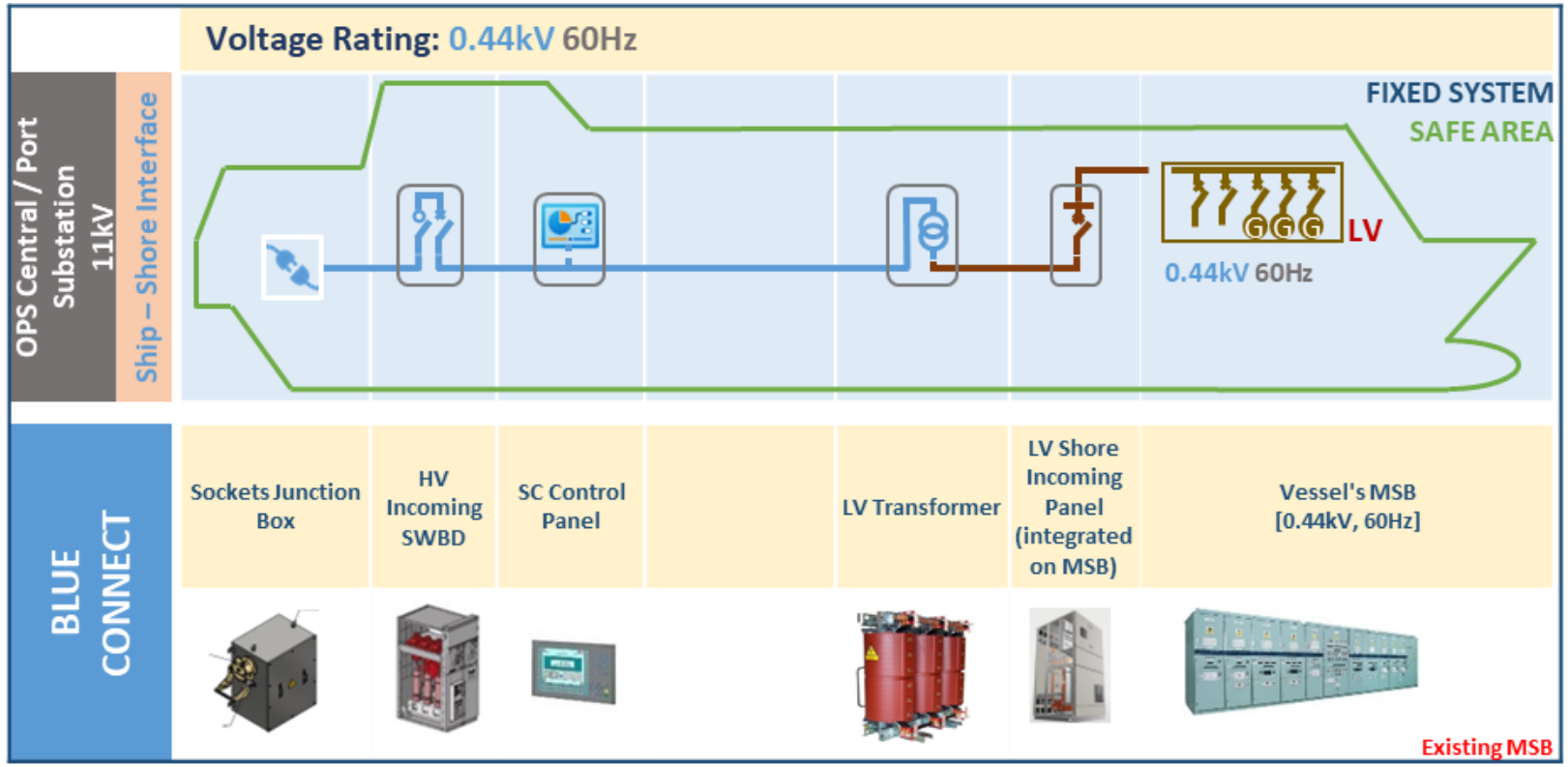
THE EQUIPMENT: MAIN CONTROL PANEL



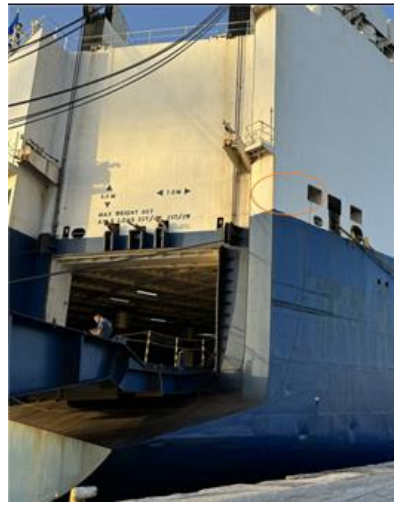
Element		Quantity [pcs]	Notes
HMI	:	2	12" multi-touch (1280 x 800) One HMI is integrated in the MCP and one is provided as loose supply for integration in LV Shore connection panel (Remote HMI)
UPS	:	1	Uninterruptible power supply with USB interface input: 24 V DC output: 24 V DC/ 10 A
Power Supply Unit	:	1	24 V/10 A stabilized power supply input: 120 - 230 V AC (110 - 240 V DC) output: 24 V / 10 A DC with diagnostic interface
Remote Control Interface	:	1	LAN router; for protection of devices/networks in automation technology and for protection of industrial communication by means of VPN and firewall
PLC – CPU	:	2	CPU, 2MB program/8MB data
PLC – Remote Control Unit	:	1	
PLC – AI Interface	:	3	
PLC – DI Interface	:	7	
PLC – DO Interface	:	2	
PLC – Sync Module	:	4	
PLC – Power Supply Units	:	2	
Com Switch		3	
USB Port	:	1	
Protection Devise	:	2	SIPROTEC S / SIP5_MaritimeCertificate_LR_2021
Safety relay	:	1	Advanced series with time delay 0,05-3 s electronic enabling circuits 2 NO instantaneous 2 NO delayed Us = 24 V DC screw terminal
EMERGENCY STOP	:	1	Emergency Stop Button 24V AC/DC 1NO/1NC
Auxiliary Equipment - Indicator Light	:	12	
Auxiliary Equipment - MCB	:	7	
Auxiliary Equipment – Selector Switch	:	2	
Auxiliary Equipment – Acoustic Signal Devise	:	1	Compact, 22 mm, round, plastic, black, Continuous tone 2.4 kHz, IP40, Sound pressure min. 80 dB/10 cm, with holder, Operating voltage 24 V AC/DC
Auxiliary Equipment – Contactor Relay	:	7	
Auxiliary Equipment – Fuse	:	52	Fuse modular terminal block with LED
Auxiliary Equipment – Panel Aux (set)	:	1	Fan, Thermostat, LED Light

REFERENCE CONFIGURATION FOR Pure Car &Truck Carriers (PCTC)
BLUE CONNECT 'Stand alone' Equipment Configuration – Shore/Ship Interface STBD

Reference	Voltage Level	Capacity	Designation	Standard
1	11kV AC	1.5 to 7.5 MVA	BLUE CONNECT equipment 11/0.44 kV AC with one socket junction box on board	IEC/ISO/IEEE 80005-1 2019: Part 1 – Annex G, Additional requirements for PCC



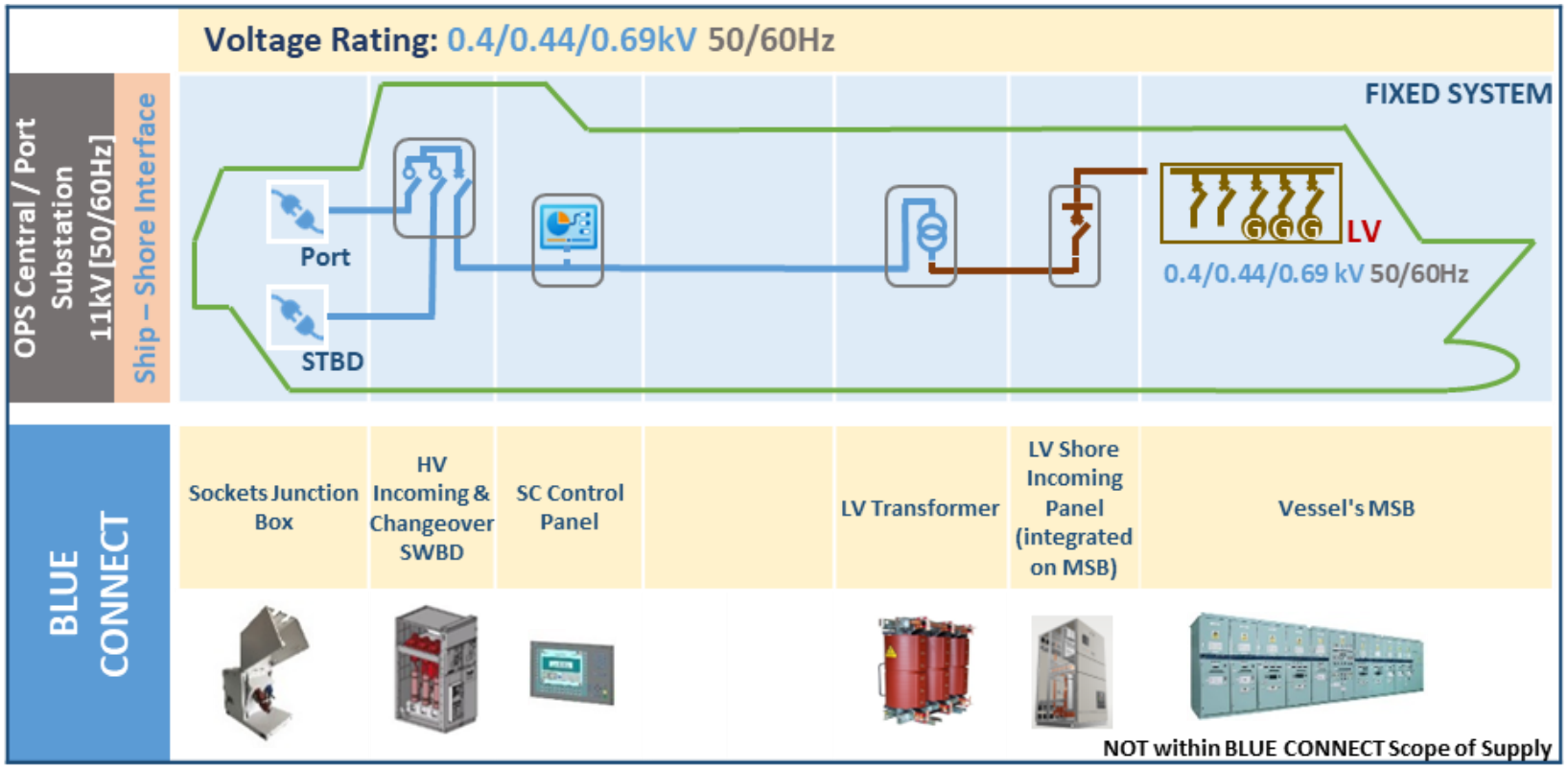
- 12kV/350A/25kA Socket Box, including FO & Aux
- 12kV/800A/25kA Gas Insulated HV Switchboard
- Cast resin Dry Type Transformer
- LV Panel with ACB for integration with MSB
- Redundant PLC & Aux Power Supply units
- Fail-safe safety relays
- Integration with PMS, IoT Services & Data Logging



ERMATECH GROUP

REFERENCE CONFIGURATION FOR Ro-Ro / Ro-Pax / Passenger Ships
BLUE CONNECT 'Stand alone' Equipment Configuration – Shore/Ship Interface P & STBD

Reference	Voltage Level	Capacity	Designation	Standard
1	11kV AC	1.5 to 7.5 MVA	BLUE CONNECT equipment 11/0.44 kV AC with two socket junction boxes on board	IEC/ISO/IEEE 80005-1 2019: Part 1 – Annex B, Additional requirements for Roll-on Roll-off (Ro-Ro) cargo ships and Ro-Ro passenger ships

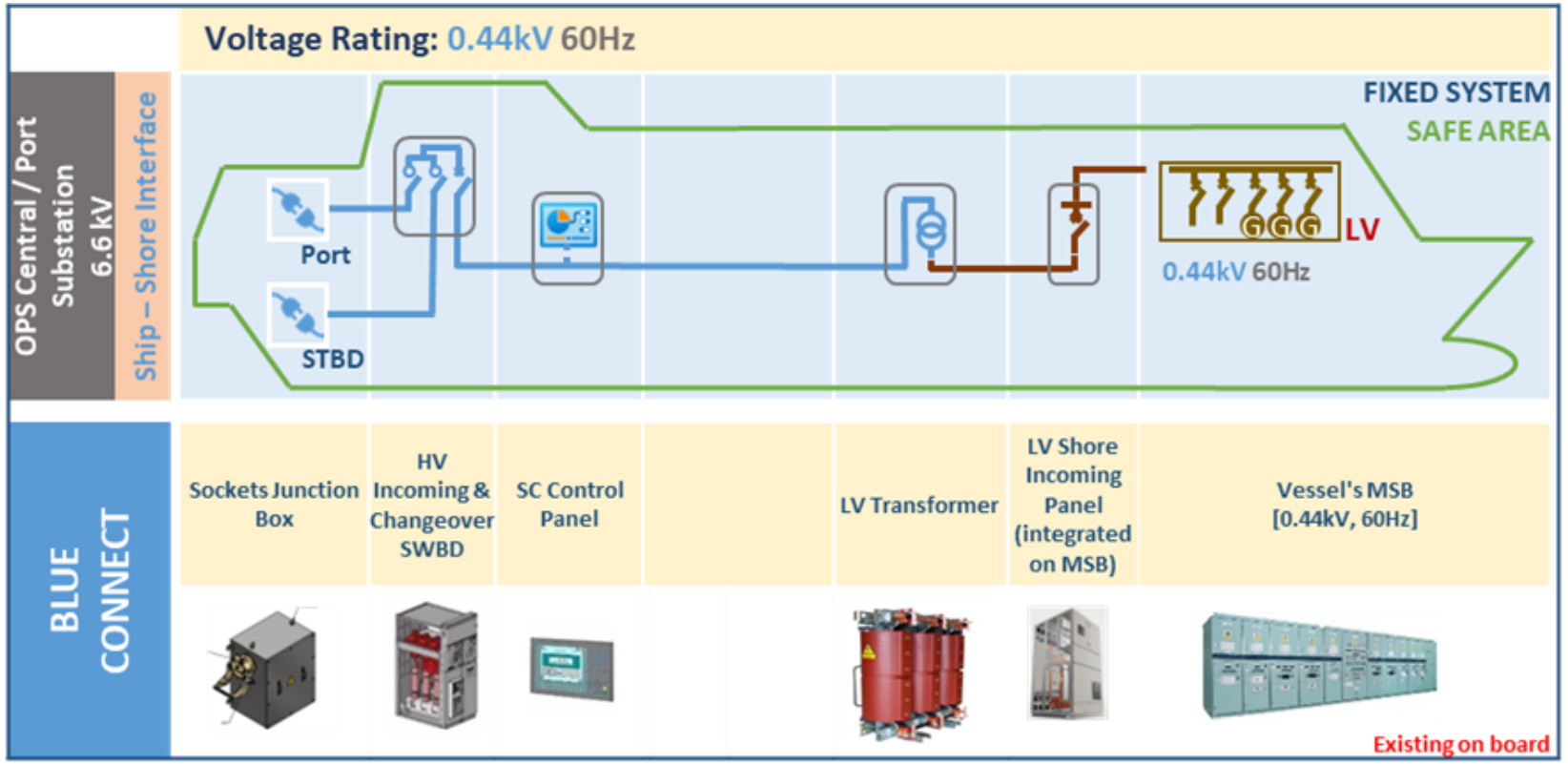


- 12kV/350A/25kA Socket Box, including FO & Aux
- 12kV/800A/25kA Gas Insulated HV Switchboard
- Cast resin Dry Type Transformer
- LV Panel with ACB for integration with MSB
- Redundant PLC & Aux Power Supply units
- Fail-safe safety relays
- Integration with PMS, IoT Services & Data Logging

ERMATECH GROUP

REFERENCE CONFIGURATION FOR TANKERS
BLUE CONNECT 'Stand alone' Equipment Configuration – Shore/Ship Interface at Safe Area

Reference	Voltage Level	Capacity	Designation	Standard
1	6.6kV AC	1.5 to 7.5 MVA	BLUE CONNECT equipment 6.6/0.44 kV AC with two socket junction boxes on board	IEC/ISO/IEEE 80005-1 2019: Part 1 – Annex F, Additional requirements for Tankers



- 7.2kV/350A/25kA Socket Box, including FO & Aux
- 12kV/800A/25kA Gas Insulated HV Switchboard
- Cast resin Dry Type Transformer
- LV Panel with ACB for integration with MSB
- Redundant PLC & Aux Power Supply units
- Fail-safe safety relays
- Integration with PMS, IoT Services & Data Logging

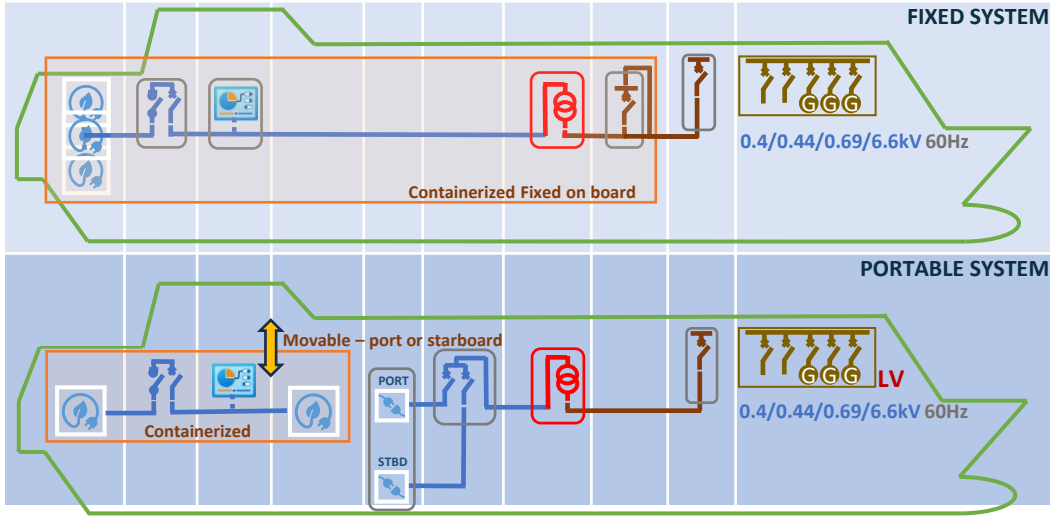
ERMATECH GROUP

REFERENCE CONFIGURATION FOR CONTAINERSHIPS
BLUE CONNECT Containerized Configuration at Low or High Voltage – Fixed & Portable

Voltage Rating: 0.4/0.44/0.69/6.6kV 60Hz

OPS Central / Port Substation 6.6kV

Ship – Shore Interface



Power Supply [MVA] max	BLUE CONNECT Model
1.5	15LV6F
2.5	25LV6F
4	40LV6F
5	50LV6F
7.5	75L(H)V6F
1.5	15LV6P
2.5	25LV6P
4	40LV6P
5	50LV6P
7.5	75L(H)V6P

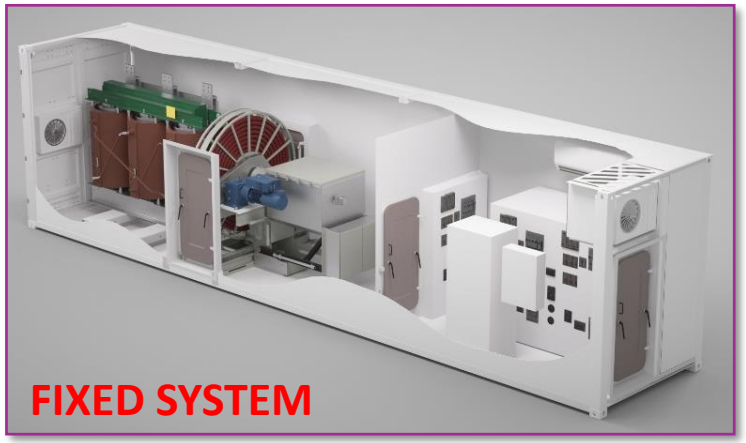
BLUE CONNECT

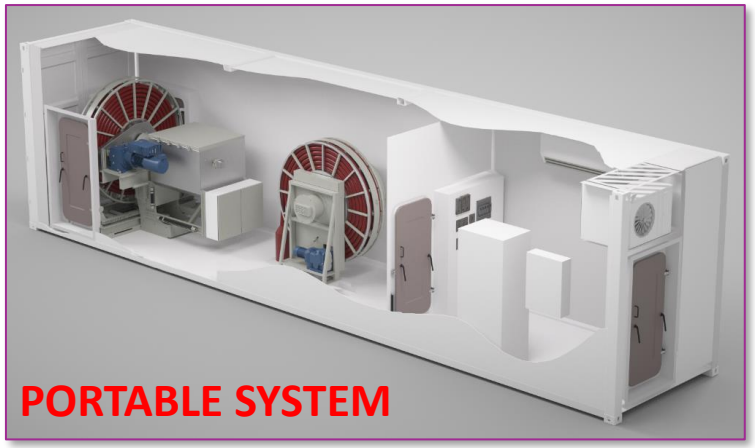
SC Cable Management System or SC Sockets Junction Box	HV Incoming SWBD	SC Control & Protection Panel	VS Cable Management System	VS Sockets Junction Box	HV Changeover Panel	Transformer (LV Config ONLY)	Shore Connection Panel [1]	Shore Incoming Panel	Vessel's MSB
									

NOT within BLUE CONNECT Scope of Supply

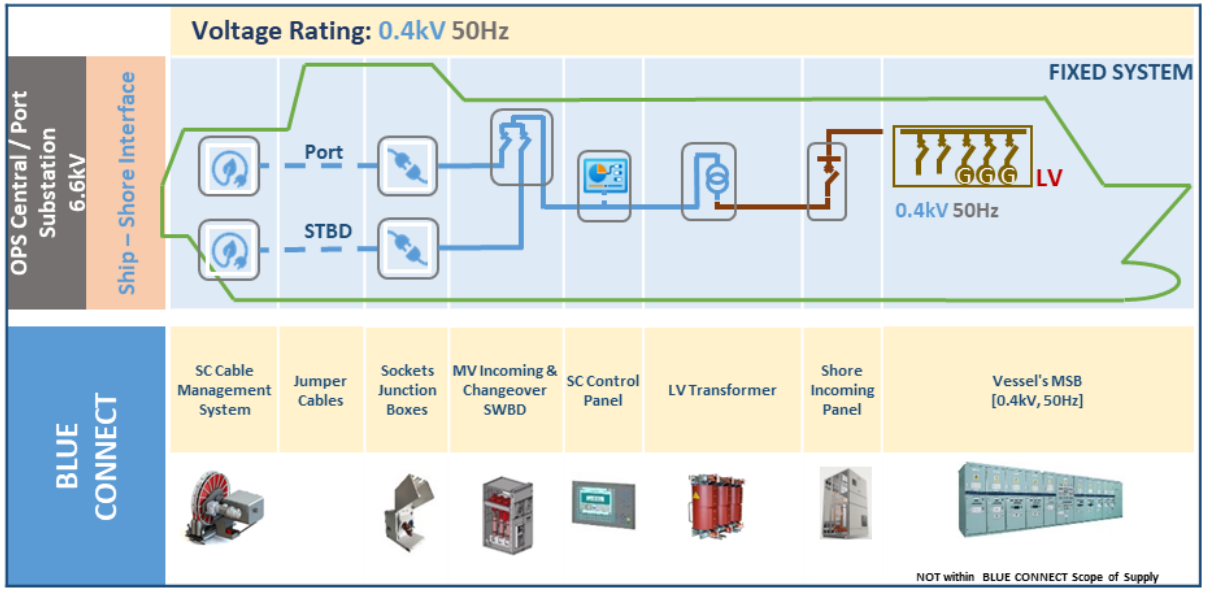
- Motorized Cable Management System
- 800A Gas Insulated Switchboard
- 25kA/1sec short-circuit withstand
- Redundant PLC & Aux Power Supply units
- Fail-safe safety relays
- Integration with IoT Services & Data Logging
- Cast resin Dry Type Transformer (AF or AN)

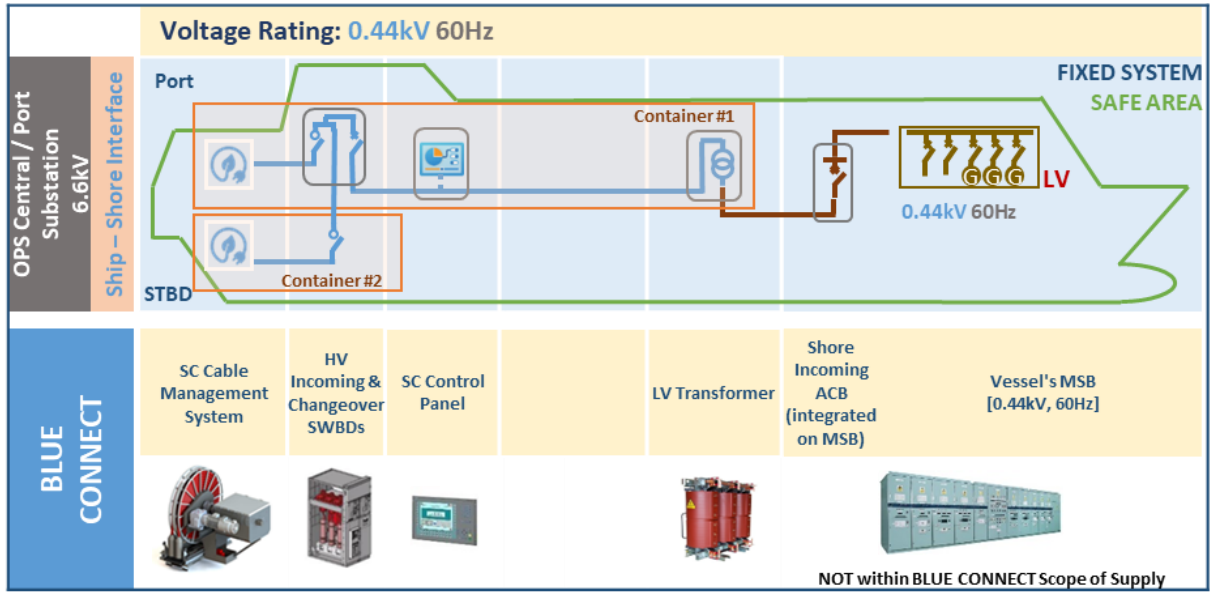
[1]: Shore Connection Panel applicable only for fixed containerized configuration

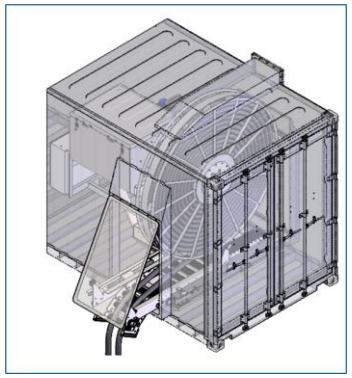


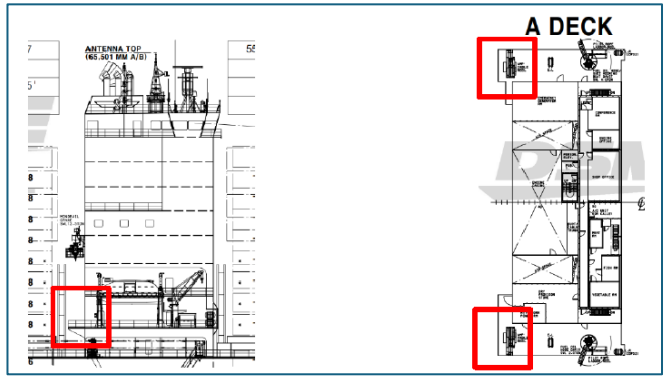


CUSTOM CONFIGURATIONS FOR CONTAINERSHIPS
BLUE CONNECT flexible design to meet operational requirements





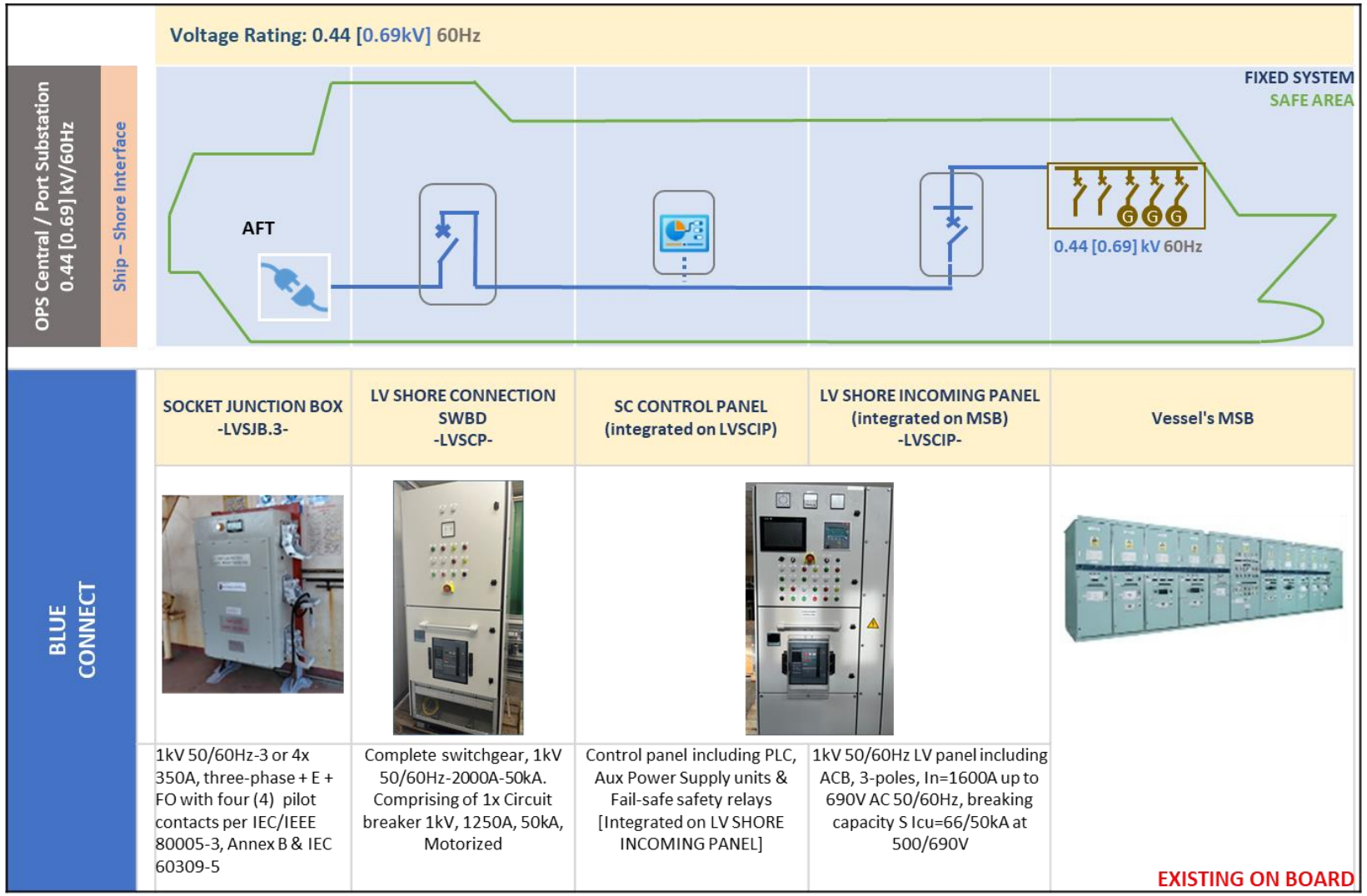




Position of AMP container onboard

- Aft-most Bay,
- Port and Starboard side,
- MV Reception Box and LV Reception Box available one or two decks below, depending on vessel series

BLUE CONNECT – LV DESIGN CONFIGURATION FOR BULK CARRIERS



Reference Low Voltage Configuration [connection to low voltage electrical network [440V or 690V / 60Hz, for load requirements up to 1000kVA] per IEC/IEEE 80005-3, Annex B.

- 1kV/2000A/50kA LV Switchboards with Class Approval
- Aux Power Supply units & Fail-safe safety relays for increased safety and reliability
- Integration with PMS, IoT Services & Data Logging

ERMATECH GROUP

AMP RETROFIT – BLUE CONNECT LV SCOPE OF SUPPLY

ERMA FIRST

Existing on board

Low Voltage Shore – Ship Interface

#Ship Type & Operational Profile#

Low Voltage Switchboard

#Protection #Configuration#

Shore Incoming LV Panel / Circuit Breaker

#MSB specs#

Ship's Main Switchboard

MONITORING, CONTROL & SYNCHRONIZATION

Ship's Power Management System

#Upgrade & load shift#

Auxiliaries

UPS, Spare Parts, Cable Guided Systems [2]

Engineering Services

Electrical / Structural

Installation Services

Electrical / Mechanical / Cabling /Inst. materials

Integration Services

PMS / AMS upgrade

Provisions

[Logistics, Warranty]

Standard Equipment Related Services

Commissioning, Testing Equipment (site tests)[2], Compatibility Assessment

[1]: OPTIONAL

ERMATECH GROUP

BLUE CONNECT: REGULATORY COMPLIANCE

BV ISSUED AiP for BLUE CONNECT AMP

BUREAU VERITAS

APPROVAL IN PRINCIPLE
LEVEL [1]
P23-211 - October 30th

At the request of:

ERMA FIRST ESK Engineering Solutions S.A.

BUREAU VERITAS MARINE & OFFSHORE (hereinafter referred to as the "Society"), acting within the scope of the Bureau Veritas Marine & Offshore General Conditions (*), declares hereunder that the design of:

"BLUE CONNECT" HIGH VOLTAGE SHORE CONNECTION SYSTEM

is **Approved in Principle**, with respect of the aim of the classification as defined in Part A, Chapter I of the latest edition of our Rules and in the conditions stated in Annex 1.The present Approval in Principle (hereinafter referred as "AiP") is referring to the general options chosen by the designer, as described in the documents listed in Annex 2.

The validity of this AiP may have to be reconsidered, in case of any major modification likely to invalidate the principles shown on the documents listed in Annex 2. This AiP would become null and

DNV RECOGNISES BLUE CONNECT AS 'ENERGY SAVING DEVICE'

DNV

ERMA FIRST ESK Engineering Solutions S.A.
Industrial Park of Schisto, Block 13
Keratsiniou-Skaramagkas
18863 Perama
Greece

DNV Hellas S.A.
Maritime R&D and Advisory
5 Aitolikou str.
18545 Piraeus, Greece
Tel: +30 210 41 00 200

Date: 2023-06-09
Our reference: L248753
Your reference: ERMA FIRST ESK Engineering Solutions S.A.

Letter of Professional Opinion for ERMA FIRST Blue Connect

DNV Maritime R&D and Advisory (DNV) performed a review of the shore power technology of ERMA FIRST ESK Engineering Solutions S.A. (ERMA FIRST) to identify whether this product falls in the category of Energy Saving devices, according to DNV expertise.

DNV is of the qualified professional opinion that the intended shore power technology of ERMA FIRST meets the necessary features and can be categorization as an Energy Saving Device (ESD), which could have a positive effect in the below ship regulatory metrics:

	EEXI	CII
ERMA FIRST Blue Connect	**No**	**Yes**

The basis of this professional opinion letter is on the provided information and documentation from ERMA FIRST and the below regulations and guidelines:

1. Marine Environment Protection Committee (MEPC) - 78th session, 6-10 June 2022, IMO.
2. 2021 Guidance on Treatment of Innovative Energy Efficiency Technologies for Calculation and Verification of the Attained EEDI and EEXI, MEPC.1/Circ. 896, 14 December 2021, IMO.
3. Handbook for decarbonization of shipping, Course to Zero, Maritime Bergen, 2021, DNV.

ERMA FIRST GROUP

BLUE CONNECT:
LIVING WITH YOUR AMP

ERMATECH GROUP

WHY BLUE CONNECT

DECARBONISATION

➢ Flexible, Reliable & Competitive Design Configurations

- ✓ **Reliability & optimized footprint:** type-tested, factory-assembled and maintenance-free, switchboards with class approval
- ✓ **Safety:** Utilization of Fail-Safe safety relays for Emergency Shut Down conditions
- ✓ **Protection, Monitoring & Control:** Developed in house monitoring, control & synchronization platform based on PLC automation with multifunction protection devise integrated
- ✓ **Communication:** Open device communication protocol with self diagnostics, developed for Integration with IoT Services, Data Logging and vessel's PMS & AMS
- ✓ **Upgrades & Modernization:** Standard Fiber Optic provision on shore ship interface equipment and on the control station to address future upgrades on communication protocols/requirements with shore
- ✓ **Compatibility Assessment Support:** Globally Designed according to all the latest standards

➢ Strong know-how on Systems integration

➢ Skilled & Responsive Support Team

➢ Competitive offering based on a wide approved components sourcing capability.

ERMATECH GROUP

THINK DECARBONISATION …

THINK ENVIRONMENTAL PROTECTION …

THINK ERMA TECH GROUP!

Contact us:

sales@ermatechgroup.com