S&SYS / SAMSUNG SAMSUNG HEAVY INDUSTRIES

Ballast Water Management System

PURIMAR™

Ballast Water Management System

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PURIMAR™, Ballast Water Management System is a safe and eco-friendly system to meet IMO's regulations, as it effectively eliminates organisms harmful to ecosystem and underwater environment.
At the same time, it reduces active materials used in the process of sterilization process to the harmless level for environment and discharges them thereafter.

Why PURIMAR™?

Space-saving design	Space optimization, Small footprint and easy installation
Non toxic by-products	Non hazardous material to be handled or stocked on board
Anti-Corrosion & Coating Protection	No corrosion problem in ballast tank and pipe
Cost saving	Low power consumption & minimal maintenance
Automatic operation	User-friendly & optimized system as well as unified & total operation
Global support	Qualified world wide service network & single service contact

PURIMAR™ is the perfect system and optimal solution taking account of customers' convenience first with integrated control through SSAS and establishment of worldwide A/S network, as it not only contains optimal installation solutions by ship type but also it realizes maximization of space utilization through modularization even in existing ships where installation is limited, and it is possible to operate the system economically utilizing the low-power treatment method which innovatively saves power consumption by treating a portion of the ballast water, differently from other methods which treat the whole ballast water.

IMO

	-2014	2014 - 2017	2017 - 2019	2019 - 2024	2014 -
New build - constructed after Eif		At delivery			
No IOPP decoupling prior to EiF	R	R	R	R First IOPP renewal after EiF R Second IOPP renewal after EiF	
Ships with decoupled IOPP prior to Eif	R	RD		RD First IOPP renewal after EiF	
Ships decoupling IOPP survey after Eif	R	R	RD First IOPP renewal after EiF R RD Second IOPP renewal after EiF		
Ships without IOPP					Latest

R IOPP renewal survey RD decoupled IOPP renewal survey Ballast Water Treatment D-2 requirement applies

EiF-Entry into, 8 September 2017
The periods in the timeline start on 8 September and on 7 September

USCG

Keel laying	BW tank Capacity(m^3)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Existing vessels : Vessels constructed before December 1, 2013													
Before Dec. 1, 2013	Less than 1,500	First dry docking after January 1. 2016							Phase I				
	1,500 ~ 5,000	First dry docking after January 1. 2014					Phase I						
	Greater than 5,000	First dry docking after January 1. 2016							Phase I				
New vessels : Vessels constructed on or after December 1, 2013													
On or after Dec. 1, 2013	All	On Delivery					Phase I						

PURIMAR™ MODEL

MODEL	BALLAST WATER FLOW (m^3/hr)	POWER CONSUMPTION (kW) *)	FOOTPRINT(m^2)
SP-50	500	12.7	11.0
SP-100	1,000	20.7	11.8
SP-150	1,500	30.4	13.3
SP-200	2,000	38.1	14.1
SP-250	2,500	47.5	15.1
SP-300	3,000	55.8	15.2
SP-400	4,000	74.2	17.0

MODEL	BALLAST WATER FLOW (m^3/hr)	POWER CONSUMPTION (kW) *)	FOOTPRINT(m^2)
SP-500	5,000	95.1	19.8
SP-600	6,000	110.4	22.4
SP-700	7,000	164.7	27.7
SP-800	8,000	184.3	29.4
SP-900	9,000	203.8	30.8
SP-1000	10,000	223.4	32.3

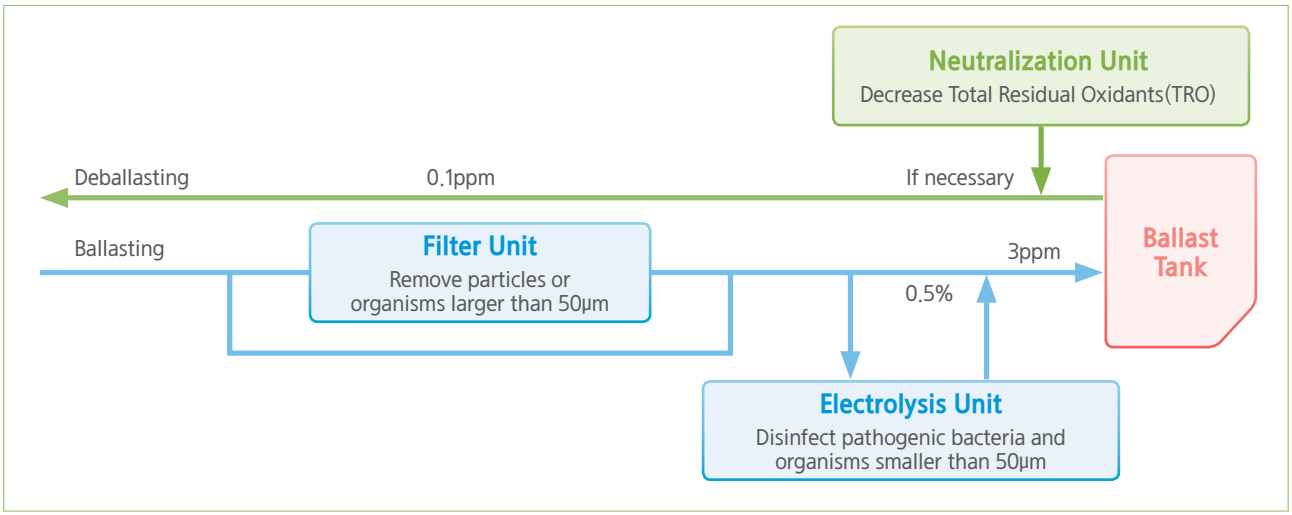
*) Power Consumption : Operating condition 20deg.C, 30PSU, excluding backflushing power
※ S&SYS has the explosion-proof model about each treatment capacity.

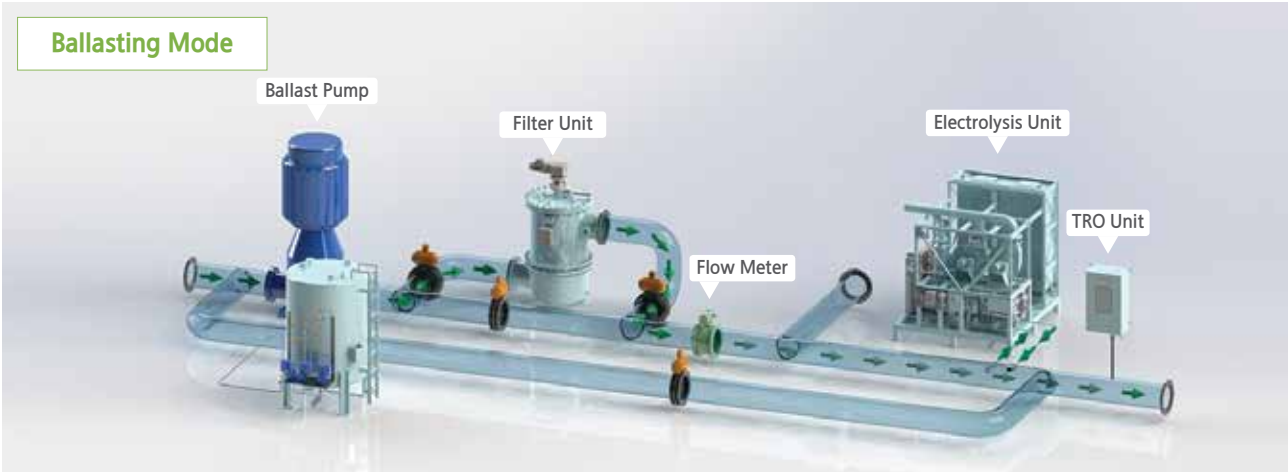
PURIMAR™ Process

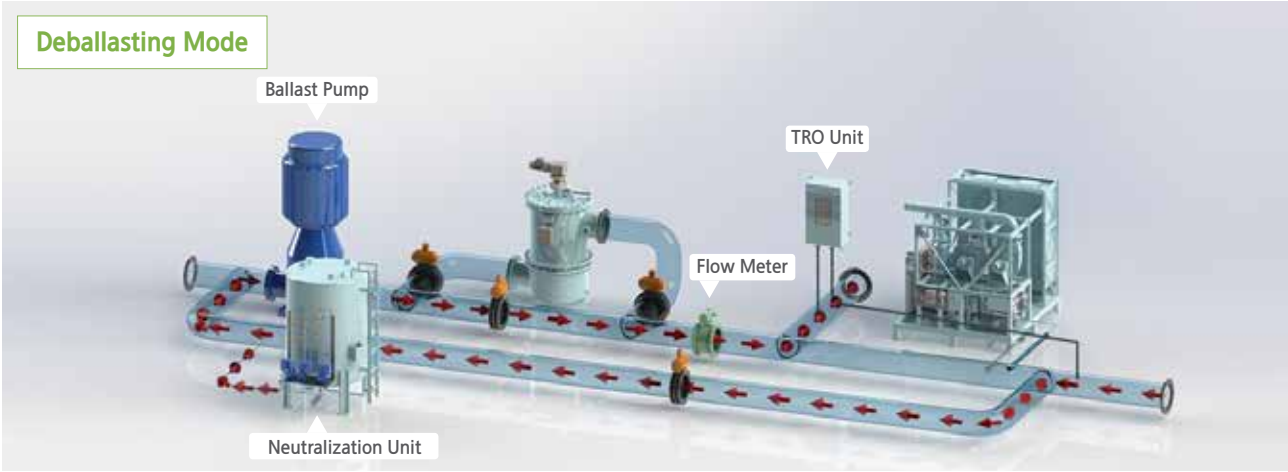
Process

1st Step	Mechanical Filtering

2nd Step	Electrolysis Disinfection

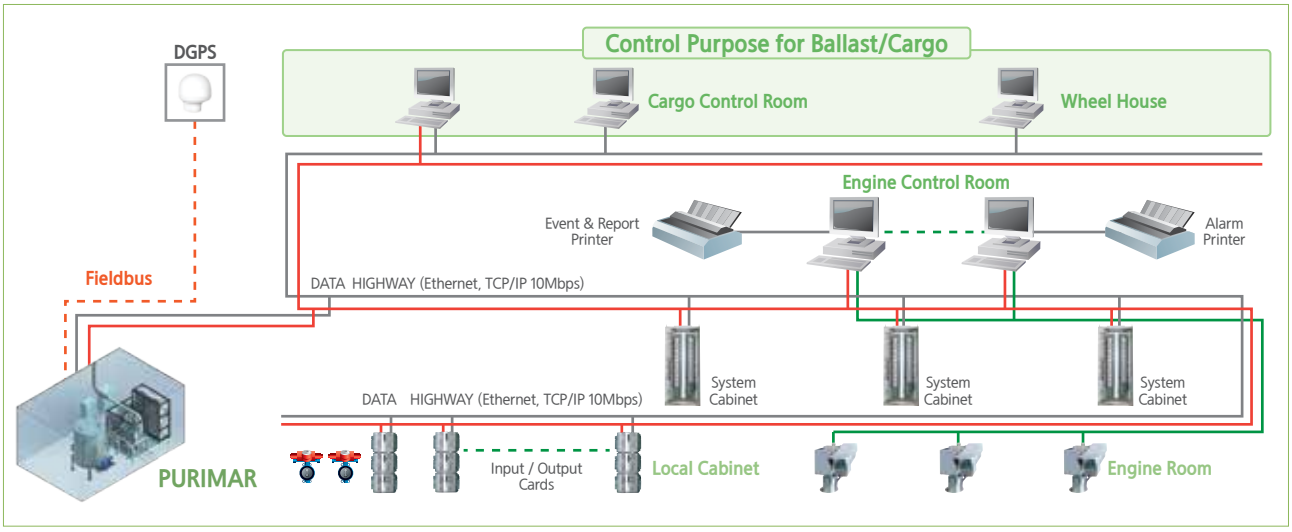






PURIMAR™ Control System

System integration with Vessel Automation System



The Integration with Vessel Automation System

- PURIMAR™ system that consists of SSAS-Pro can be interworked with Vessel's Automation system.
- Integration package based on SSAS-Pro can achieve cost reduction and optimization of system configuration.

User Interface of PURIMAR™

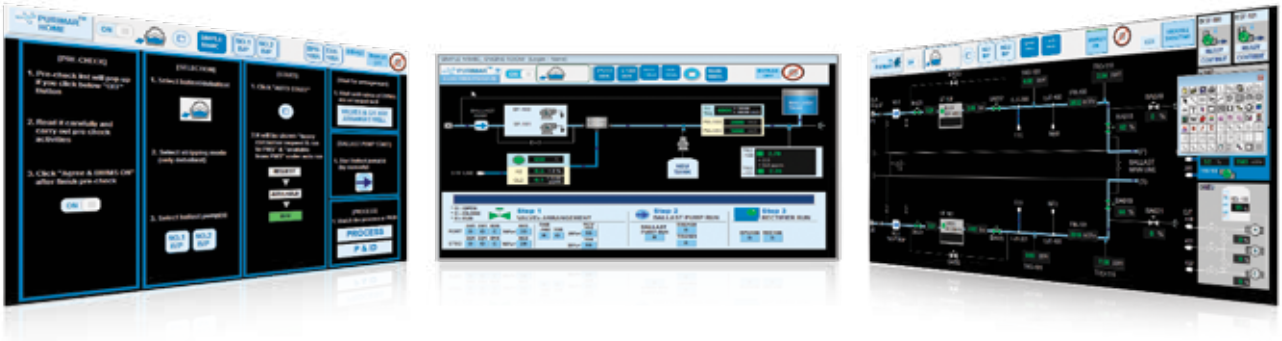
PURIMAR's UI is designed user-friendly by GITOS(Graphic Intelligent Tools of Systems) which is a process control system of SSAS-Pro and provides the most optimized automation system. Through the UI, it is able to build an environment in which a user can operate PURIMAR in a simple and easy way.

Main Function

- Various user interface
- Ballast / Deballast mode function
- Monitoring & Alarm function
- Data logging function
- Global position indication function by user command

Ballast / Deballast Mode

- User selection function by ballast / deballast mode
- Automatic control by ballast pump driving
- Automatic control by optimum solution



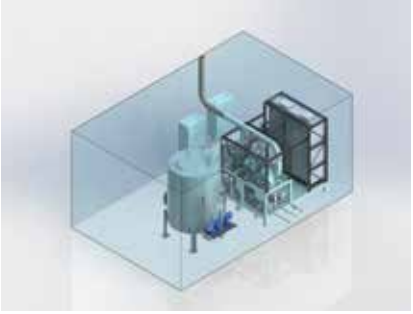
PURIMAR™ Installation

Package Skid System

- Fully compatible and integrated system
- Shortened installation time
- Small footprint
- Flexible installation in engine room or other area

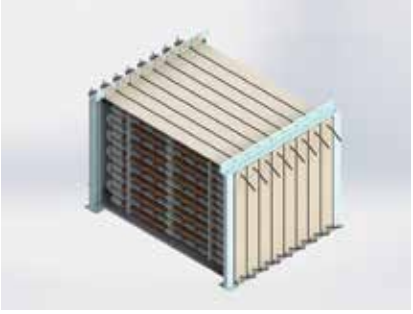
Containerized System

- No need of additional test and assembly
- Shortened delivery time due to standardization
- Self contained system
- Ideal choice for installation in hazard area



Modularized System

- Reasonable solution for retrofits
- Space saving design
- Flexible design to fit in available space
- Separated units which are modularized and available in any location



Electrolyzer

Filter Unit

Neutralization Unit

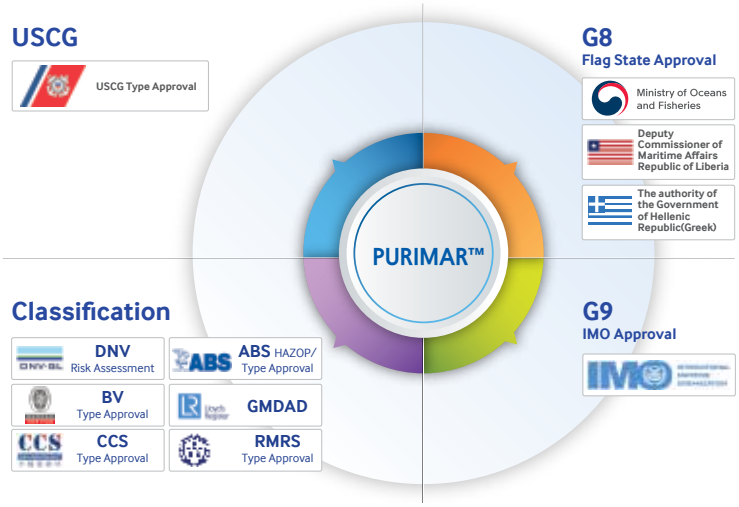
MCP & PDP

Rectifier

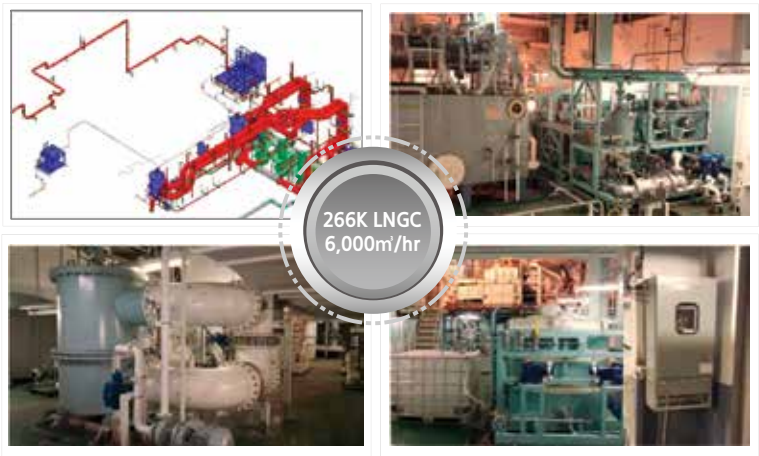
Hydro Cyclone & Blower

PURIMAR™ Retrofit

PURIMAR's Solution

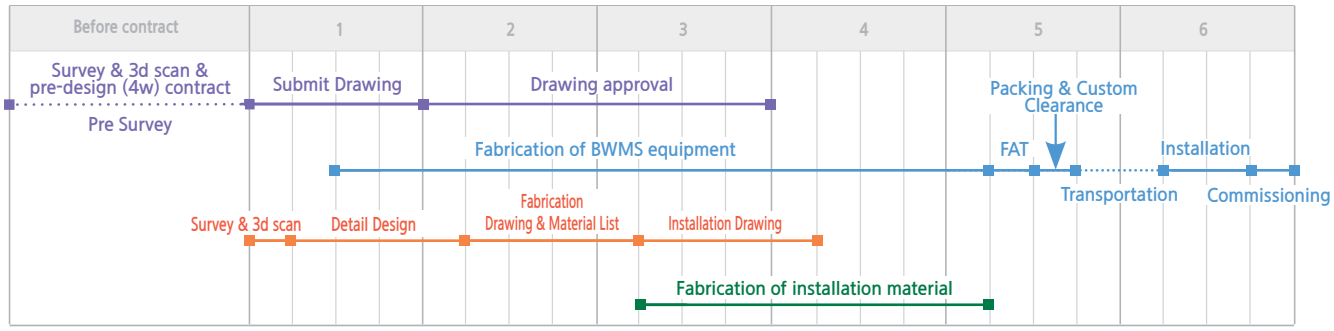


PURIMAR™ RETROFIT REFERENCE



Item	Division
Case1	Equipment Only
Case2	Equipment + Design for Installation
Case3	Turn key base (Equipment + Design for Installation + Installation)

Master Schedule



※ Installation period could be changed according to the repair shipyard ability or D/D period.

PURIMAR™ Global Network

ASIA	
KOREA	S&SYS Co.,Ltd.
KOREA	STK Engineering
KOREA	JEWON Engineering
CHINA	Seven Seas Electronic Co.,Ltd.(Shanghai)
CHINA	Seven Seas Electronic Co.,Ltd.(Qingdao)
CHINA	Seven Seas Electronic Co.,Ltd.(Dalian)
CHINA	SAMSUN Marine Technology(HK) Co.,Ltd.
CHINA	SJE
INDIA	Indostan
JAPAN	Orient Marine Co.,LTD.
JAPAN	JRCS MFG Co.,Ltd.
SINGAPORE	Treys Ple Ltd.
TAIWAN	RESON Electronics
CENTRAL AMERICA	
PANAMA	PASRAS S.A
MIDDLE EAST	
U.A.E	MARITRONICS
U.A.E	Tensosys
NORTH AMERICA	
USA	MarineBCTec(LA)
USA	USA MarineBCTec(NJ)
SOUTH AMERICA	
BRAZIL	METALOCK Brazil Ltd.
BRAZIL	DZETA Marine & Offshore
EUROPE	
GERMANY	Mare systems
ITALY	MASTER CONTROL
GREECE	D.C.S.I International Ltd.
NETHERLAND	Euronavig Holdings
TURKEY	Ozsay Deniz

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