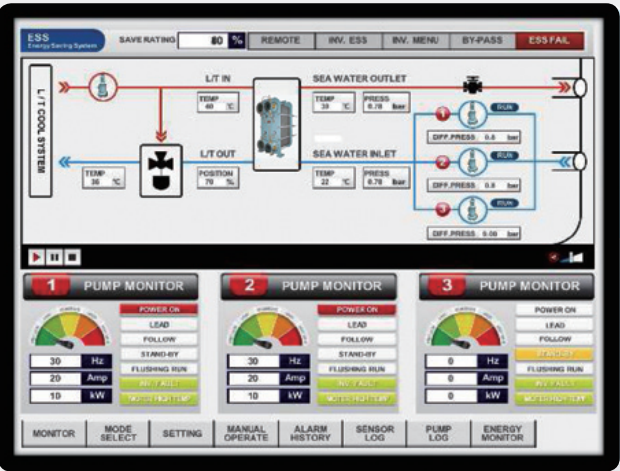


Energy Saving System

Screen of ESS controller



Reduction

- ▶ Greenhouse gas emission
- ▶ Fuel oil (DO, HFO) consumption

Regulation

- ▶ EEDI



Donghwa Entec Energy Saving System Standard Table

MODEL	DH-ESS 15	DH-ESS 18.5	DH-ESS 22	DH-ESS 30	DH-ESS 37	DH-ESS 45	DH-ESS 55	DH-ESS 75
POWER	440V 3ph 60Hz	440V 3ph 60Hz	440V 3ph 60Hz	440V 3ph 60Hz	440V 3ph 60Hz	440V 3ph 60Hz	440V 3ph 60Hz	440V 3ph 60Hz
PUMP MOTOR CAPACITY	15KW	18.5KW	22KW	30KW	37KW	45KW	55KW	75KW
DIMENSION	A	2000	2000	2000	2000	2300	2300	2600
	B	1800	1800	1800	1800	1800	1800	2000
	C	520	520	520	520	520	520	520
WEIGHT(kg)	380	400	430	450	450	450	470	660

MODEL	DH-ESS 90	DH-ESS 110	DH-ESS 132	DH-ESS 150	DH-ESS 160	DH-ESS 185	DH-ESS 200	DH-ESS 250
POWER	440V 3ph 60Hz	440V 3ph 60Hz	440V 3ph 60Hz	440V 3ph 60Hz	440V 3ph 60Hz	440V 3ph 60Hz	440V 3ph 60Hz	440V 3ph 60Hz
PUMP MOTOR CAPACITY	90KW	110KW	132KW	150KW	160KW	185KW	200KW	250KW
DIMENSION	A	2600	2900	2900	2900	3800	3800	3800
	B	2000	2200	2200	2200	2200	2200	2200
	C	600	650	650	650	700	700	700
WEIGHT(kg)	660	950	950	950	1100	1300	1300	1300



Head Office and Factory (Land Area: 15,574 m² / Building Area: 13,845 m²)



Hwajeon Office and Factory (Land Area: 20,127 m² / Building Area: 20,087 m²)



Energy Environmental Tec. Lab. (Land Area: 4,465 m² / Building Area: 3,365 m²)



DongHwa Entec (Shanghai) Co., Ltd. (Land Area: 33,350 m² / Building Area: 18,457 m²)

DongHwa Entec

Donghwa Entec Co.,Ltd

Noksan Office and Factory

7, Noksansandan 261-ro, Gangseo-gu, Busan, Korea
T. +82-51-970-1000 F. +82-51-970-1001

Hwajeon Office and Factory

20, Hwajeonsandan 1-ro 63beon-gil, Gangseo-gu, Busan, Korea
T. +82-51-970-1100 F. +82-51-970-0710

Energy-Environmental Technology Laboratory

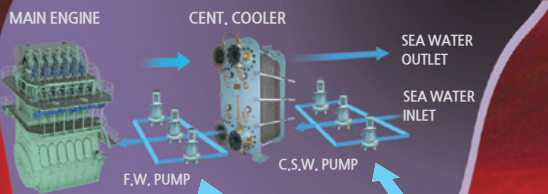
7, Gwahaksandan-ro 305beon-gil, Gangseo-gu, Busan, Korea
T. +82-51-970-0711 F. +82-51-970-0730

DongHwa Entec (Shanghai) Co., Ltd.

No.2508 Jiangshan Road Lingang New City Shanghai China 201308
TEL : +86 (0)21-5197-5001 FAX : +86 (0)21-5197-5005

▶ Cryogenic Heat Exchanger and System Engineering Global Leader

ESS Energy Saving System



Reduction

- ▶ Greenhouse gas emission
- ▶ Fuel oil (DO, HFO) consumption

Regulation

- ▶ EEDI



ESS CONTROLLER

Energy Saving System



The advantage of ESS

- High energy saving rate up to 40%
- CO2 Reduction according to Save fuel oil(DO, HFO)
- Automatic flushing
 - Anti-fouling
 - Adjust flushing timing
- Stability of system
 - Set the minimum flow-rate
- Continuous operation variable pump speed control
- Reduction in the start current

Introduction

Recently, efforts of the various aspects and regulations for sailing ships to reduce the CO2 have been established. IMO MEPC 203 (62) meeting mentioned Energy Efficiency Design Index (EEDI) for new ships and a Ship Energy Efficiency Management Plan (SEEMP) through MARPOL Annex VI Regulation, and the raising energy efficiency is becoming inevitable.

In the vessel, there are many products that can enhance the energy efficiency depending on the environment conditions.

Among them, ESS is a product to reduce total power consumption by controlling pump of S.W., F.W., E / R ventilation fan and cargo hold fan.

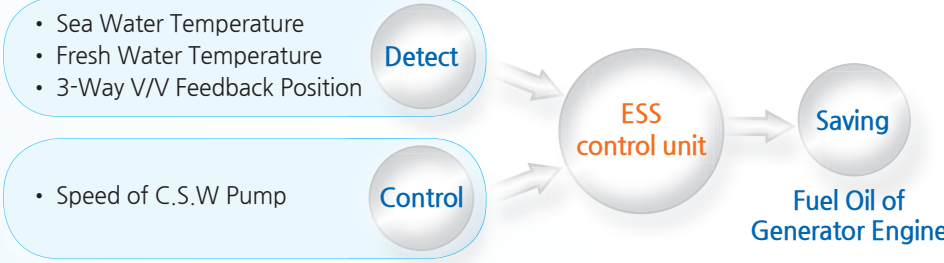
Therefore, how much energy can be reduced by ESS?

Surprisingly by reducing the motor RPM of 10% through the ESS, 27% of power consumption is saving.

As result of this, you can significantly save fuel Oil of D/G unnecessarily consuming on the ship.

Operating Principle

- 1) C.S.W PUMP : Monitoring temperature of sea water, low temperature of fresh water and the position of 3-way valve.
- 2) F.W PUMP : Controlling by F.W. inlet's T/T of Central Cooler and pump's P/T
- 3) E/R VENTILATION FAN : Step controlling by under M/E load. In addition, by detecting inlet's high temp and negative pressure in engine room, helps the ship to adequately sail.
- 4) CARGO HOLD FAN : Controlling by checking temp of cargo room.

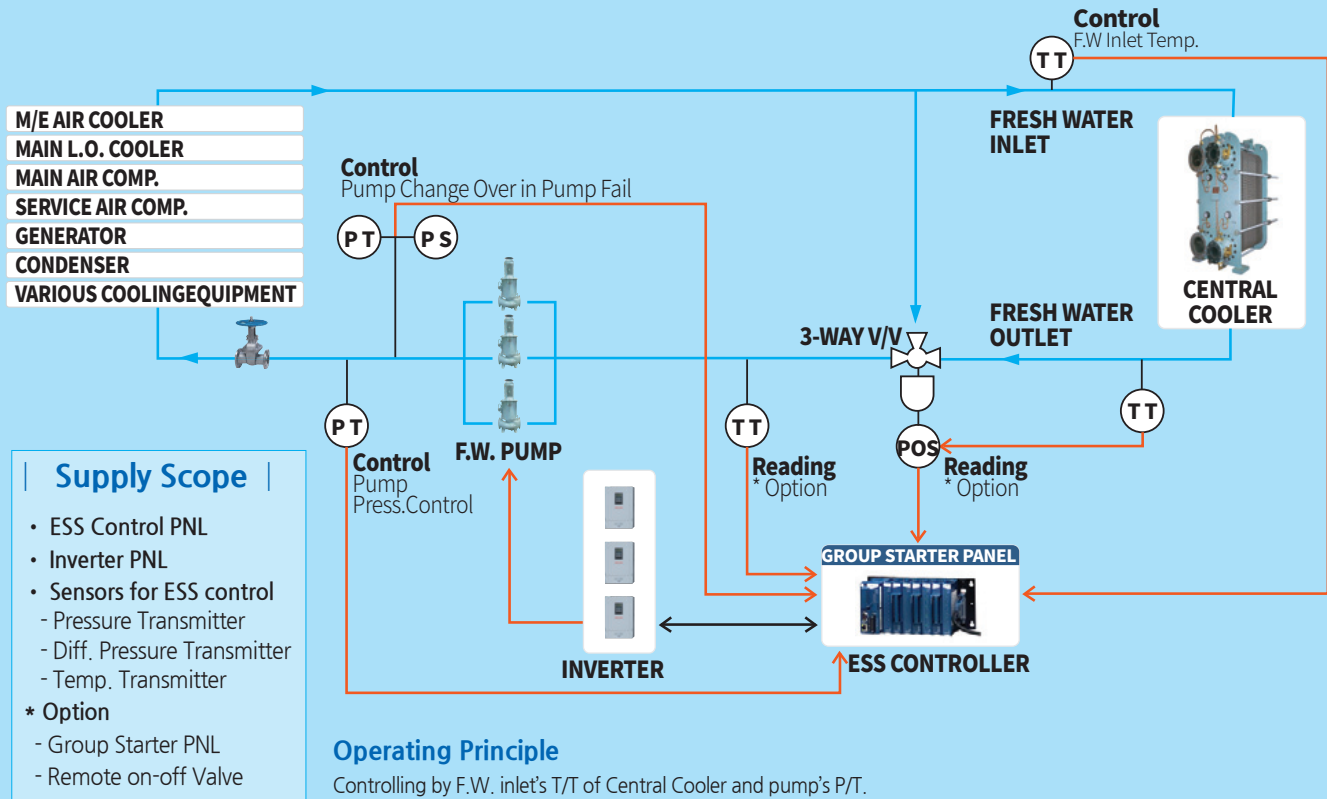


Type of Energy Saving System

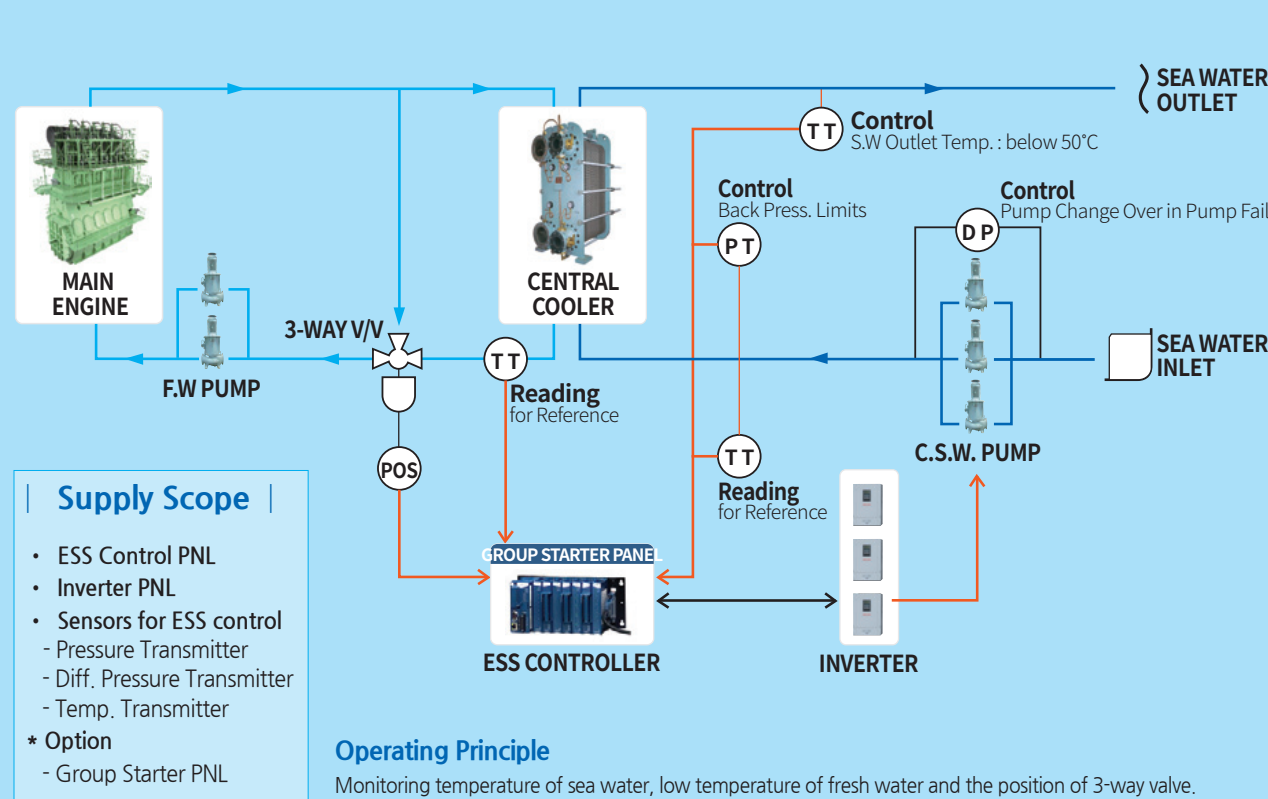
1	2
Group Start PNL	Group Start PNL
ESS Unit PNL	ESS Unit PNL
C, S.W, Pump	C, S.W, Pump
Number of inverters	3 Inverters
Starting Method	Inverter start / DOL
Normal pump operation mode	Inverter (ESS) mode*
Standby pump operation mode	Inverter mode* & Bypass mode*

* Inverter mode: Operating with ESS, * By-pass mode: Operating without ESS, as conventional pump operating

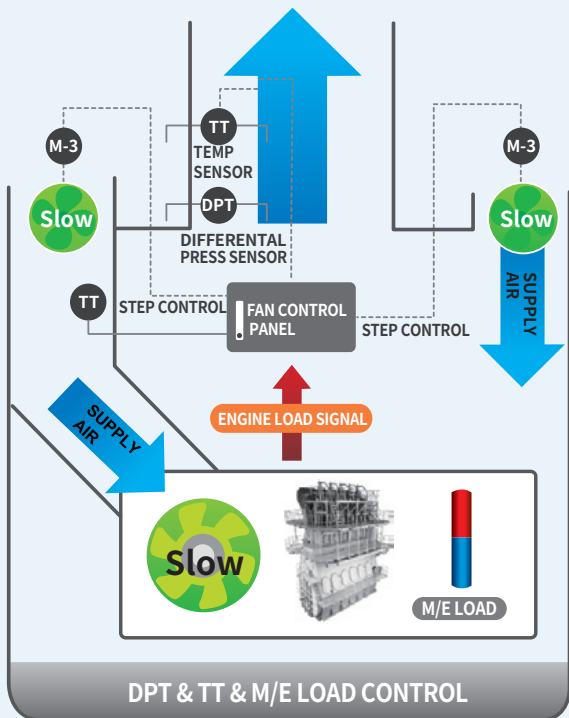
Fresh Water Pump Control



Sea Water Pump Control



E/R Ventilation Fan Control



Cargo Hold Fan Control

