



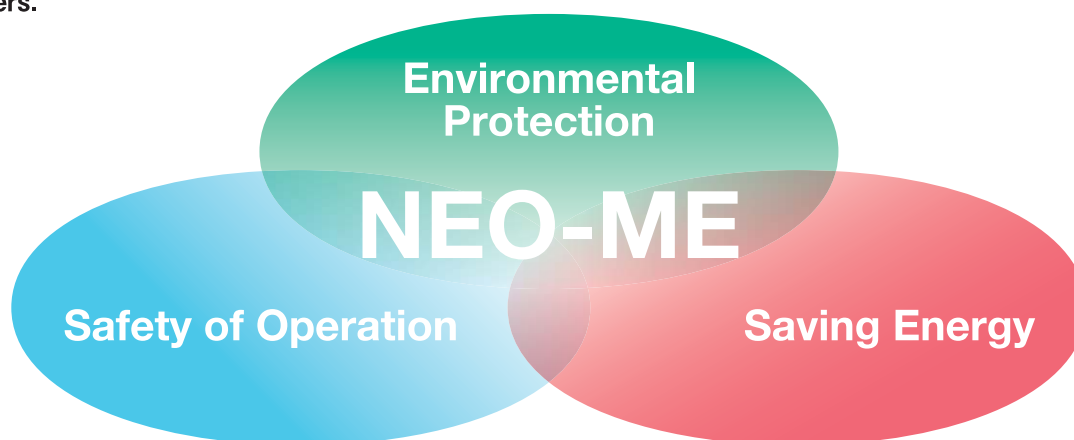
NANIWA ECOLOGICAL OPERATION

NEO-ME SERIES

NANIWA ECOLOGICAL OPERATION

Introduction

Naniwa Pump supports customer expectation for “greener ships”, paying close attention to the following parameters.



Current central cooling system design runs pumps continuously at full speed. Capacity of Main Cooling Sea Water Pumps has been calculated based on 100% main engine load at 32 degree C sea water. Depending on actual vessel operating condition Main Cooling Sea Water Pump discards sea water to cooling system.

	Design ⇒ Actual	Required Pump Capacity	Required Power
Sea Water	32 degree C ⇒ 25 degree C	18.4% Down	45.6% Down
Main Engine Load	100% ⇒ 50%	50.0% Down	87.5% Down

*Based on 8,000teu Container carrier

Working Principle

Naniwa Pump developed NEO-ME series to operate Main Cooling Sea Water Pumps with economy and safety. Its standard features are as follows:

High response performance to main engine load	0% Speed at 100% F.W. Circulation	Optimized operation for vessel speed reduction
Adaptive to sea water temperature change	Automatic Flushing	Full time minimum fuel consumption

Naniwa Pump designed NEO-ME series controlling rotational speed of Main Cooling Sea Water Pump according to following information.

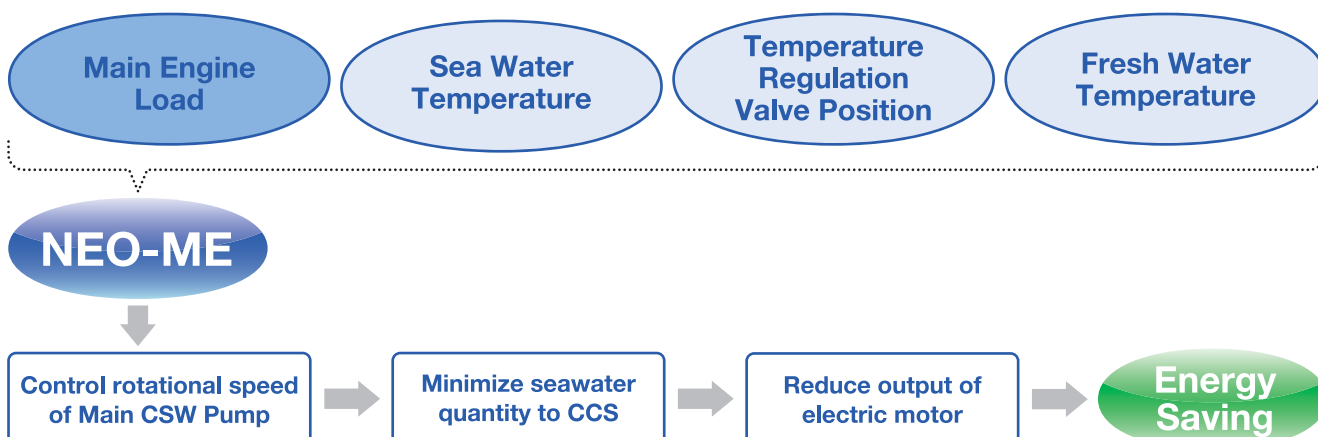
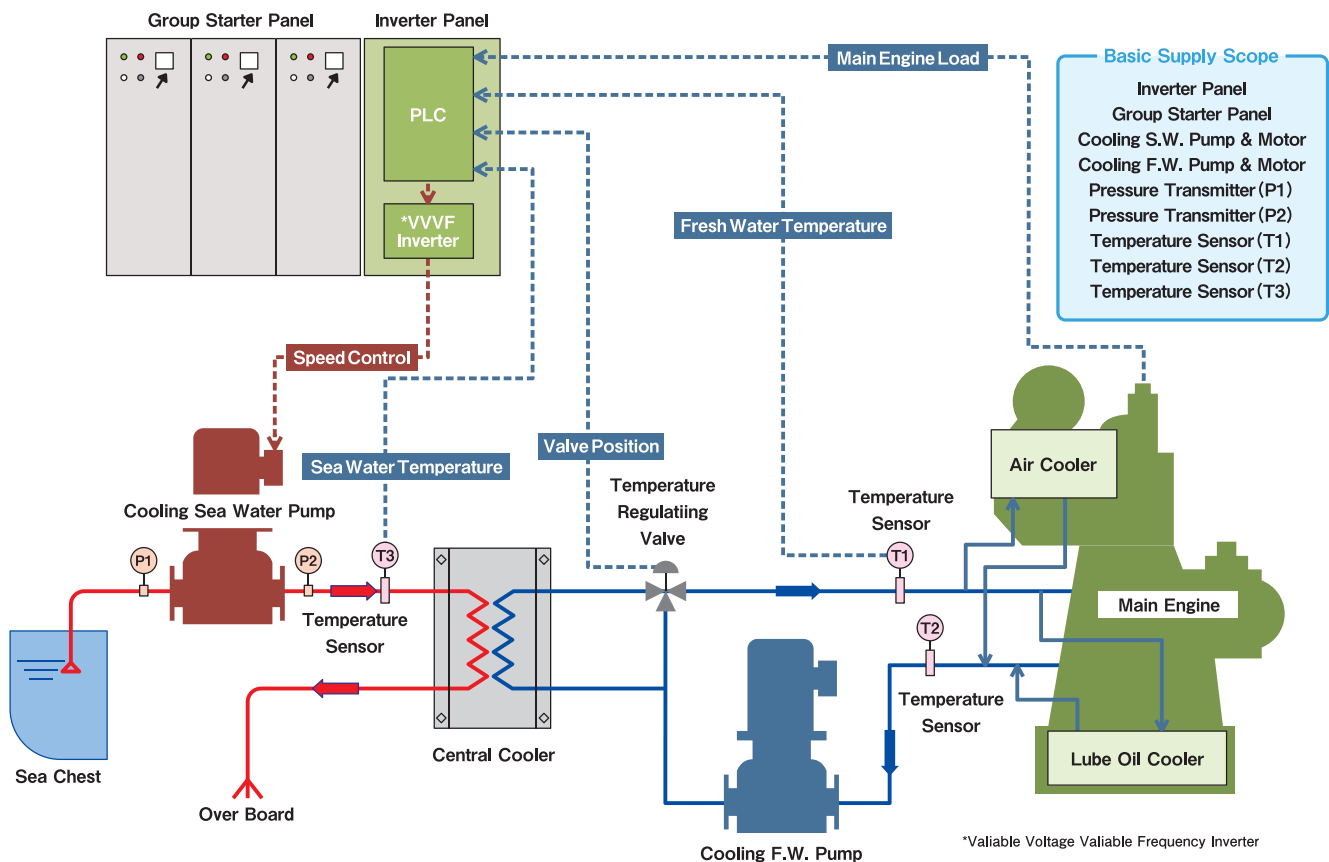


Diagram for Central Cooling System with NEO-ME series



How does NEO-ME affect fuel consumption?

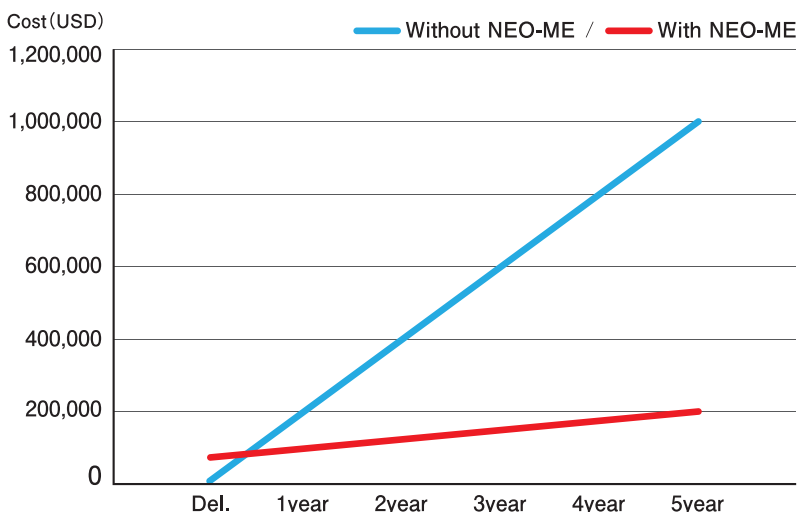
■ Fuel Consumption of Generator Engine

334.8ton/year

88% Less

44.0ton/year

■ Cash Flow

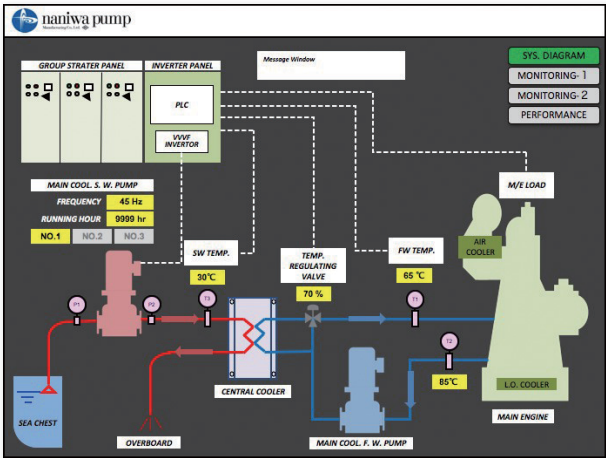


Basic Technical Data

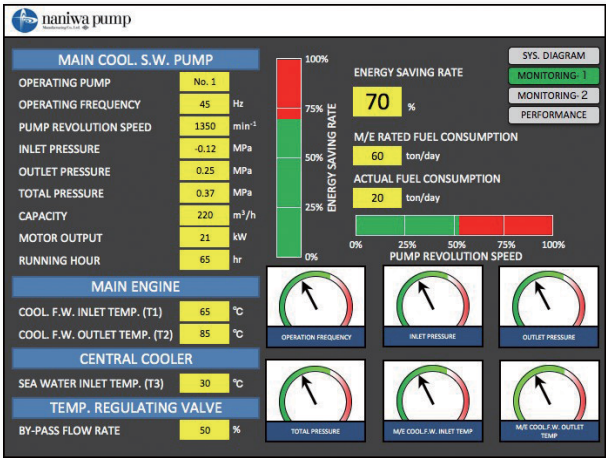
- Ship type: 9,000 ~ 10,000teu Container Carrier
- Inverter Driven Main Cool. S. W. Pump:
2 set x 1,500m³/h x 20m x 125kW x 1,150rpm
- Shaft Horse Power at specific QH point: 110kW
- Average Rotational Speed of the pump: 575rpm
(50% of rated speed, Assumption)
- Shaft Horse Power at 50% of rated speed: 13.75kW
- Design Data of Aux. Engine
 - Rate of fuel consumption: 190g/kWh
 - Efficiency of generator: 94%
 - Operation time (Assumption): 7,000hours per year
- Efficiency of Inverter: 95%
- Electric Motor
 - Rating: 125kW-6P
 - Efficiency: 93%
- Bunker Price: USD 600/ton

Monitoring Panel for NEO-ME series (12 in Touch Screen)

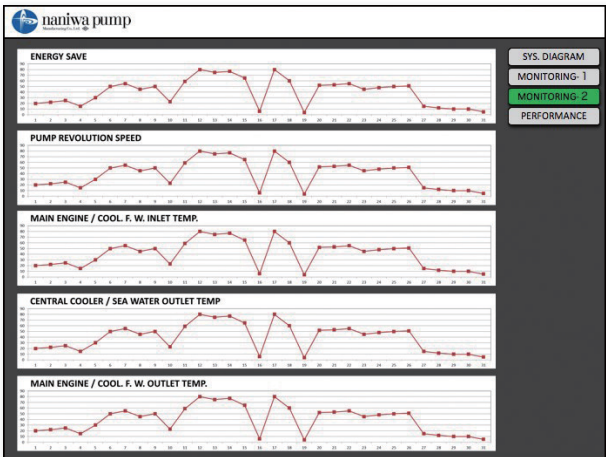
■ System Diagram



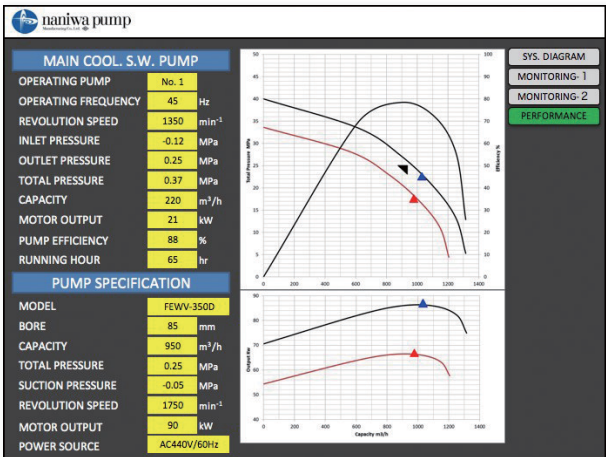
■ Monitoring 1 (Present Operating Condition)



■ Monitoring 2 (Operating Record)



■ Performance (Pump Operating Condition)



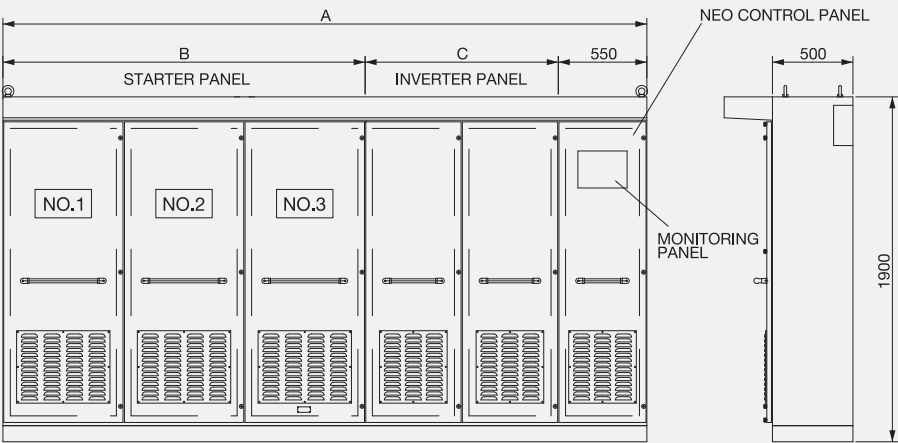
Standard Table for NEO-ME series

■ NEO Controlled Pump

Pump Model	FEWV-250 FEV-250-2	FEWV-300	FEWV-350	FEWV-400	FEWV-450	FEWV-500
Capacity (m ³ /h)	300~580	450~830	830~1100	1100~1600	1600~2100	2100~3000
Total Head (m)	15~25	15~25	15~25	15~25	15~25	15~25
Motor Output (kW)	30~55	45~90	55~110	75~150	100~160	125~280

MODEL

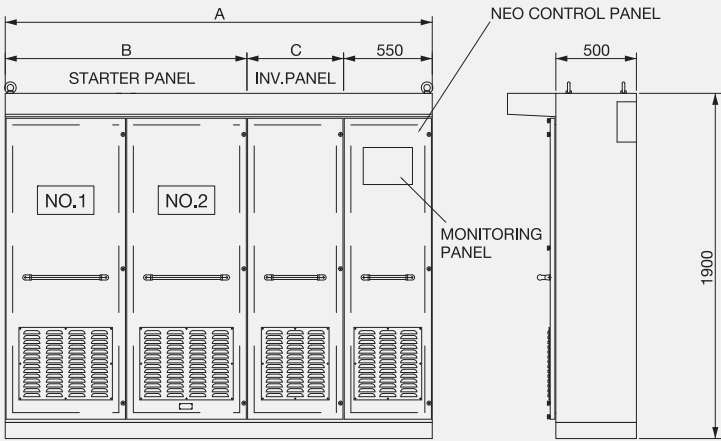
NEO-ME_P (2 pumps parallel running)



Operating Condition		2 pumps parallel running					
Model		NEO-ME30P	NEO-ME37P	NEO-ME45P	NEO-ME55P	NEO-ME75P	NEO-ME90P
Motor Output (kW)		30	37	45	55	75	90
Dimension	A	4000	4000	4000	4700	4700	4700
	B	2250	2250	2250	2850	2850	2850
	C	1200	1200	1200	1300	1300	1300
Model		NEO-ME110P	NEO-ME132P	NEO-ME160P	NEO-ME200P	NEO-M220P	NEO-ME280P
Motor Output (kW)		110	132	160	200	220	280
Dimension	A	4700	6050	6050	6650	6650	6650
	B	2850	3600	3600	3900	3900	3900
	C	1300	1900	1900	2200	2200	2200

MODEL

NEO-ME_S (1 pump singular running)



Operating Condition		1 pump singular running					
Model		NEO-ME30S	NEO-ME37S	NEO-ME45S	NEO-ME55S	NEO-ME75S	NEO-ME90S
Motor Output (kW)		30	37	45	55	75	90
Dimension	A	2650	2650	2650	3100	3100	3100
	B	1500	1500	1500	1900	1900	1900
	C	600	600	600	650	650	650
Model		NEO-ME110S	NEO-ME132S	NEO-ME160S	NEO-ME200S	NEO-M220S	NEO-ME280S
Motor Output (kW)		110	132	160	200	220	280
Dimension	A	3100	3900	3900	4250	4250	4250
	B	1900	2400	2400	2600	2600	2600
	C	650	950	950	1100	1100	1100

Pump@Sea

Naniwa delivers top efficient pumps & systems

NANIWA PUMP MFG. Co., LTD.

Main Office

11-5, Shinmachi 3-Chome, Nishi-ku, Osaka 550-0013, Japan
Tel: +81-6-6541-6231 / Fax: +81-6-6541-7492
e-mail: info@naniwa-pump.co.jp / Web: naniwa-pump.co.jp