MECTRA

SYNERGY

NORTHERN LIGHTS

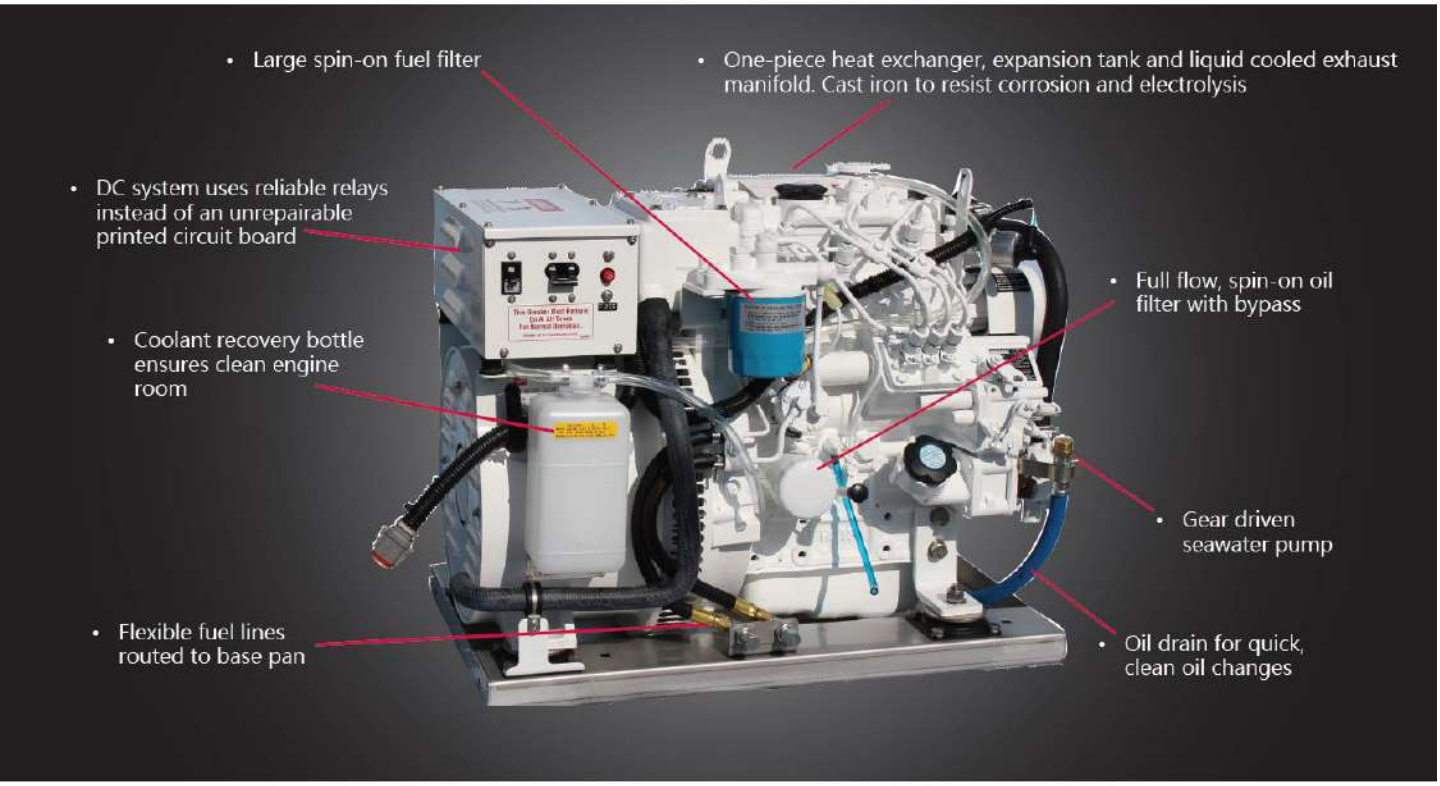
Marine Generator Catalogue

NORTHERN LIGHTS®

MECTRA SYNERGY

M673LD3G

5 kW (60 Hz, 1800 rpm)
4.5 kW (50 Hz, 1500 rpm)



SPECIFICATIONS AND DIMENSIONS

AC Output[1]

5 kW	60 Hz, 1800 RPM, 1 Ph, 1.0 PF, 240 V/20.8 A, 120 V/41.6 A
4.5 kW	50 Hz, 1500 RPM, 1 Ph, 1.0 PF, 220 V/20.5 A
Voltage regulation	±5%

1. Based on SAE J1995 and ISO 3046.

Weight and Height

Approximate dry weight	371 lbs (168 kg)
Length	27.5 in (698 mm)
Width	17.1 in (434 mm)
Height	20.4 in (517 mm)
Sound enclosure weight	34 lbs (15.4 kg)
Enclosure length	28.5 in (724 mm)
Enclosure width	19.5 in (495 mm)
Enclosure height	20.9 in (530mm)

Consult factory for classification society.

US EPA Tier III

Engine Data

Type	Vertical inline 3 cylinder diesel
Displacement	46.4 in³ (0.761 ltr)
Bore/Stroke	2.64/2.83 in (67/72 mm)
HP @ RPM	10.1/1800 8.4/1500
Approximate fuel use [2]:	
1800 RPM @ full load	0.59 gph (2.2 lph)
1800 RPM @ half load	0.32 gph (1.2 lph)
1500 RPM @ full load	0.50 gph (1.9 lph)
1500 RPM @ half load	0.28 gph (1.1 lph)

2. Actual fuel consumption will vary depending on operating conditions.

Installation Data

Wet exhaust elbow	1.5 inch (38 mm) OD
Raw water inlet	3/4 in (19 mm) OD
Fuel inlet and return	5/16 - - 37T JIC

Information and dimensions are subject to change without notice.

NORTHERN LIGHTS®

MECTRA SYNERGY

M673LD3G
5 kW (60 Hz, 1800 rpm)
4.5 kW (50 Hz, 1500 rpm)

FEATURES AND BENEFITS

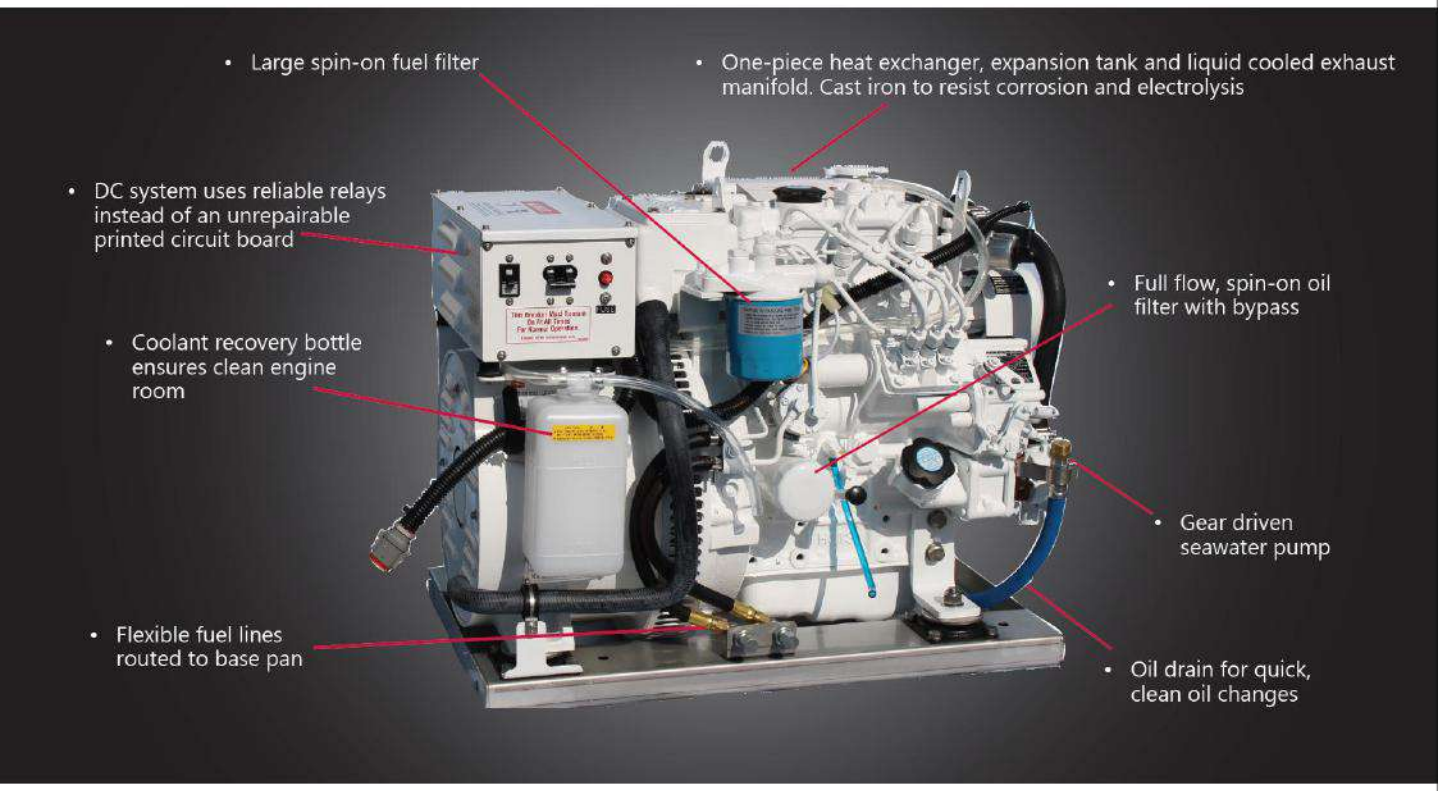
Engine Block	Four cycle, 3 cylinder, liquid cooled, naturally aspirated, overhead valve diesel with glow plugs for quick starting. Swirl combustion chambers improve fuel efficiency and reduce smoke.
Cooling System	Standard heat exchanger cooling with optional keel cooling. Copper-nickel, tube-type heat exchanger has removable rubber end caps for easy cleaning, and no need for zincs. The bronze and stainless steel seawater pump with rubber impeller is gear driven, eliminating a potential failure point.
Fuel System	The self-venting fuel system features an inline injection pump with 3-5% mechanical governor for close AC frequency control. Stop solenoid acts directly on the fuel rack eliminating external linkage problems. The fuel lift pump is mechanical with a hand primer, eliminating electronic pump failures. Flexible fuel lines plumbed to base pan as standard.
Intake and Exhaust	The M673LD3G meets US EPA Tier III emission standards. Its cast aluminum intake manifold with Sound Maze system reduces noise, and its washable air cleaner makes routine maintenance simple. The wet exhaust elbow is stainless steel.
Lubrication System	The closed crankcase vent system traps oil vapor and keeps engine room clean. 3.1 qt (3 ltr) oil capacity for better lubrication and 200 hour oil change intervals. Oil drain hose allows for ease of maintenance.
DC Electrical System	The DC System features a 12 volt starter motor and battery charging alternator with belt guard. The set is equipped with a standard remote mount control panel, featuring an hour meter, stop-start switch with run light and a preheat switch, and includes a 20 foot (6m) harness. The standard panel can be expanded to six panels, up to 110 feet from the set. Low oil pressure, high coolant temperature and high exhaust temperature safety shutdowns are standard.
AC Generator	The Northern Lights, direct coupled, four pole, four lead generator has Class "H" insulation, a pre-lubricated bearing and features a conservative heat rise rating of 95°C/50°C ambient. Our automatic voltage regulator gives you ±5% voltage regulation. The AVR protected by a dedicated circuit breaker.

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

NORTHERN LIGHTS®

M:CTRA SYNERGY

M673L3G
6 kW (60 Hz, 1800 rpm)
5 kW (50 Hz, 1500 rpm)



SPECIFICATIONS AND DIMENSIONS

AC Output[1]

6 KW	60 Hz, 1800 RPM, 1 Ph, 1.0 PF, 240 V/25 A, 120 V/50 A
5 KW	50 Hz, 1500 RPM, 1 Ph, 1.0 PF, 220 V/22.7 A
Voltage regulation	±5%

1. Based on SAE J1995 and ISO 3046.

Weight and Height

Approximate dry weight	371 lbs (168 kg)
Length	27.5 in (698 mm)
Width	17.1 in (434 mm)
Height	20.2 in (512 mm)
Sound enclosure weight	34 lbs (15.4 kg)
Enclosure length	28.5 in (724 mm)
Enclosure width	19.5 in (495 mm)
Enclosure height	20.9 in (530 mm)

Engine Data

Type	Vertical inline 3 cylinder diesel
Displacement	46.4 in^3 (0.761 ltr)
Bore/Stroke	2.64/2.83 in (67/72 mm)
HP @ RPM	10.1/1800 8.4/1500
Approximate fuel use [2]:	
1800 RPM @ full load	0.59 gph (2.2 lph)
1800 RPM @ half load	0.32 gph (1.2 lph)
1500 RPM @ full load	0.50 gph (1.9 lph)
1500 RPM @ half load	0.28 gph (1.1 lph)

2. Actual fuel consumption will vary depending on operating conditions.

Installation Data

Wet exhaust elbow	1.5 inch (38 mm) OD
Raw water inlet	3/4 in (19 mm) OD
Fuel inlet and return	5/16 - 37T JIC

Consult factory for classification society.

US EPA Tier III

Information and dimensions are subject to change without notice.

NORTHERN LIGHTS

MECTRA SYNERGY

M673L3G
6 kW (60 Hz, 1800 rpm)
5 kW (50 Hz, 1500 rpm)

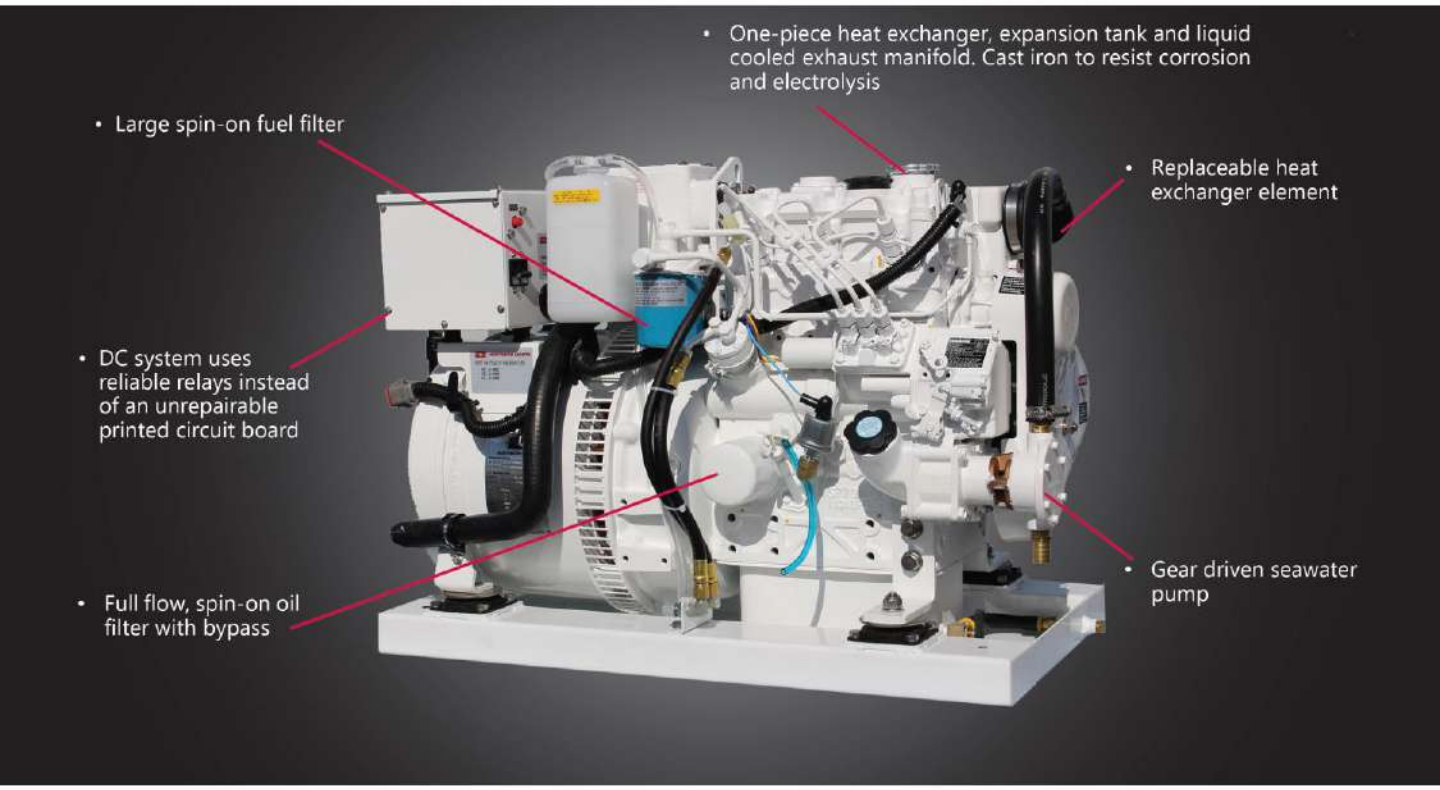
FEATURES AND BENEFITS

Engine Block	Four cycle, 3 cylinder, liquid cooled, naturally aspirated, overhead valve diesel with glow plugs for quick starting. Swirl combustion chambers improve fuel efficiency and reduce smoke.
Cooling System	Standard heat exchanger cooling with optional keel cooling. Copper-nickel, tube-type heat exchanger has removable rubber end caps for easy cleaning, and no need for zincs. The bronze and stainless steel seawater pump with rubber impeller is gear driven, eliminating a potential failure point.
Fuel System	The self-venting fuel system features an inline injection pump with 3-5% mechanical governor for close AC frequency control. Stop solenoid acts directly on the fuel rack eliminating external linkage problems. The fuel lift pump is mechanical with a hand primer, eliminating electronic pump failures. Flexible fuel lines plumbed to base pan as standard.
Intake and Exhaust	The M673L3G meets US EPA Tier III emission standards. Its cast aluminum intake manifold with Sound Maze system reduces noise, and its washable air cleaner makes routine maintenance simple. The wet exhaust elbow is stainless steel.
Lubrication System	The closed crankcase vent system traps oil vapor and keeps engine room clean. 3.1 qt (3 ltr) oil capacity for better lubrication and 200 hour oil change intervals. Oil drain hose allows for ease of maintenance.
DC Electrical System	The DC System features a 12 volt starter motor and battery charging alternator with belt guard. The set is equipped with a standard remote mount control panel, featuring an hour meter, stop-start switch with run light and a preheat switch, and includes a 20 foot (6m) harness. The standard panel can be expanded to six panels, up to 110 feet from the set. Low oil pressure, high coolant temperature and high exhaust temperature safety shutdowns are standard.
AC Generator	The Northern Lights, direct coupled, four pole, four lead generator has Class "H" insulation, a pre-lubricated bearing and features a conservative heat rise rating of 95°C/50°C ambient. Our automatic voltage regulator gives you ±5% voltage regulation. The AVR protected by a dedicated circuit breaker.

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

NORTHERN LIGHTS MECTRA SYNERGY

M773LW3G
9 kW (60 Hz, 1800 rpm)
7 kW (50 Hz, 1500 rpm)



SPECIFICATIONS AND DIMENSIONS

AC Output[1]

9 KW	60 Hz, 1800 RPM, 1 Ph, 1.0 PF, 120/240 V/37.5 A, 120 V/75 A
7 KW	50 Hz, 1500 RPM, 1 Ph, 1.0 PF, 220 V/31.8 A
Optional	Three Phase with 0.8 PF
Voltage regulation	±1%

1. Based on SAE J1995 and ISO 3046.

Weight and Height

Approximate dry weight	537 lbs (244 kg)
Length	33.4 in (848 mm)
Width	17.4 in (442 mm)
Height	24.0 in (608 mm)
Sound enclosure weight	60 lbs (27.2 kg)
Enclosure length	35.0 in (889 mm)
Enclosure width	22.0 in (559 mm)
Enclosure height	25.7 in (654 mm)

Consult factory for classification society.

US EPA Tier III

Engine Data

Type	Vertical inline 3 cylinder diesel
Displacement	69 in^3 (1.13 ltr)
Bore/Stroke	3.03/3.19 in (77/81 mm)
HP @ RPM	15/1800 12/1500
Approximate fuel use [2]:	
1800 RPM @ full load	0.93 gph (3.52 lph)
1800 RPM @ half load	0.51 gph (1.93 lph)
1500 RPM @ full load	0.72 gph (2.72 lph)
1500 RPM @ half load	0.37 gph (1.40 lph)

2. Actual fuel consumption will vary depending on operating conditions.

Installation Data

Wet exhaust elbow	2 inch (51 mm) OD
Raw water inlet	3/4 in (19 mm) OD
Fuel inlet	5/16 - 37T JIC
Fuel return	1/4 - 37T JIC

Information and dimensions are subject to change without notice.

NORTHERN LIGHTS

MECTRA SYNERGY

M773LW3G
9 kW (60 Hz, 1800 rpm)
7 kW (50 Hz, 1500 rpm)

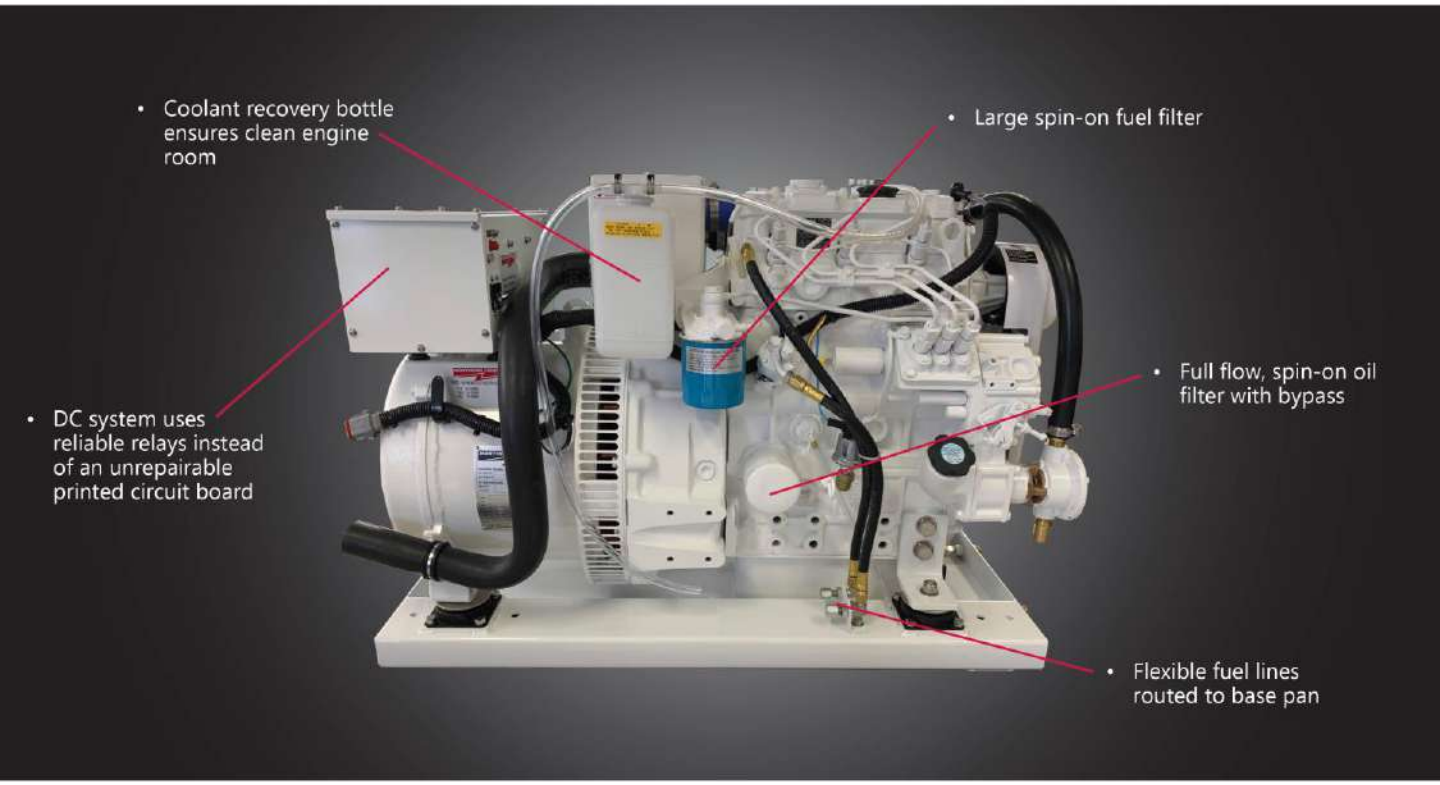
FEATURES AND BENEFITS

Engine Block	Four cycle, 3 cylinder, liquid cooled, naturally aspirated, overhead valve diesel with glow plugs for quick starting. Swirl combustion chambers improve fuel efficiency and reduce smoke.
Cooling System	Standard heat exchanger cooling with optional keel cooling. Copper-nickel, tube-type heat exchanger has removable rubber end caps for easy cleaning, and no need for zincs. The bronze and stainless steel seawater pump with rubber impeller is gear driven, eliminating a potential failure point.
Fuel System	The self-venting fuel system features an inline injection pump with 3-5% mechanical governor for close AC frequency control. Stop solenoid acts directly on the fuel rack eliminating external linkage problems. The fuel lift pump is mechanical with a hand primer, eliminating electronic pump failures. Flexible fuel lines plumbed to base pan as standard.
Intake and Exhaust	The M773LW3G meets US EPA Tier III emission standards. Its cast aluminum intake manifold with Sound Maze system reduces noise, and its washable air cleaner makes routine maintenance simple. The wet exhaust elbow is stainless steel.
Lubrication System	The closed crankcase vent system traps oil vapor and keeps engine room clean. 4.2 qt (6.5 ltr) oil capacity for better lubrication and 200 hour oil change intervals. Oil drain hose with valve plumbed to base pan as standard.
DC Electrical System	The DC System features a 12 volt starter motor and battery charging alternator with belt guard. The set is equipped with a standard remote mount control panel, featuring an hour meter, stop-start switch with run light and a preheat switch, and includes a 20 foot (6m) harness. The standard panel can be expanded to six panels, up to 110 feet from the set. Low oil pressure, high coolant temperature and high exhaust temperature safety shutdowns are standard.
AC Generator	The Northern Lights, direct coupled, four pole, four lead generator has Class "H" insulation, a pre-lubricated bearing and features a conservative heat rise rating of 95°C/50°C ambient. Our automatic voltage regulator gives you ±1% voltage regulation. The AVR protected by a dedicated circuit breaker.

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

NORTHERN LIGHTS® MECTRA SYNERGY

M843NW3G
12 kW (60 Hz, 1800 rpm)
10 kW (50 Hz, 1500 rpm)



SPECIFICATIONS AND DIMENSIONS

AC Output[1]

12 KW	60 Hz, 1800 RPM, 1 Ph, 1.0 PF, 240 V/50 A, 120 V/100 A
10 KW	50 Hz, 1500 RPM, 1 Ph, 1.0 PF, 220 V/45.4 A
Optional	Three phase with 0.8 PF
Voltage regulation	±1%

1. Based on SAE J1995 and ISO 3046.

Weight and Height

Approximate dry weight	797 lbs (355 kg)
Length	38.5 in (977 mm)
Width	19.0 in (482 mm)
Height	25.2 in (641 mm)
Sound enclosure weight	53 lbs (24 kg)
Enclosure length	38.8 in (986 mm)
Enclosure width	22.6 in (574 mm)
Enclosure height	25.8 in (655 mm)

Engine Data

Type	Vertical inline 3 cylinder diesel
Displacement	91 in³ (1.5 ltr)
Bore/Stroke	3.30/3.50 in (84/90 mm)
HP @ RPM	20/1800 17/1500
Approximate fuel use [2]:	
1800 RPM @ full load	1.20 gph (4.50 lph)
1800 RPM @ half load	0.62 gph (2.30 lph)
1500 RPM @ full load	1.00 gph (3.78 lph)
1500 RPM @ half load	0.51 gph (1.93 lph)

2. Actual fuel consumption will vary depending on operating conditions.

Installation Data

Wet exhaust elbow	2 inch (51 mm) OD
Raw water inlet	3/4 in (19 mm) OD
Fuel inlet	5/16 - 37T JIC
Fuel return	1/4 - 37T JIC

Consult factory for classification society.

US EPA Tier III

Information and dimensions are subject to change without notice.

NORTHERN LIGHTS

MECTRA SYNERGY

M843NW3G
12 kW (60 Hz, 1800 rpm)
10 kW (50 Hz, 1500 rpm)

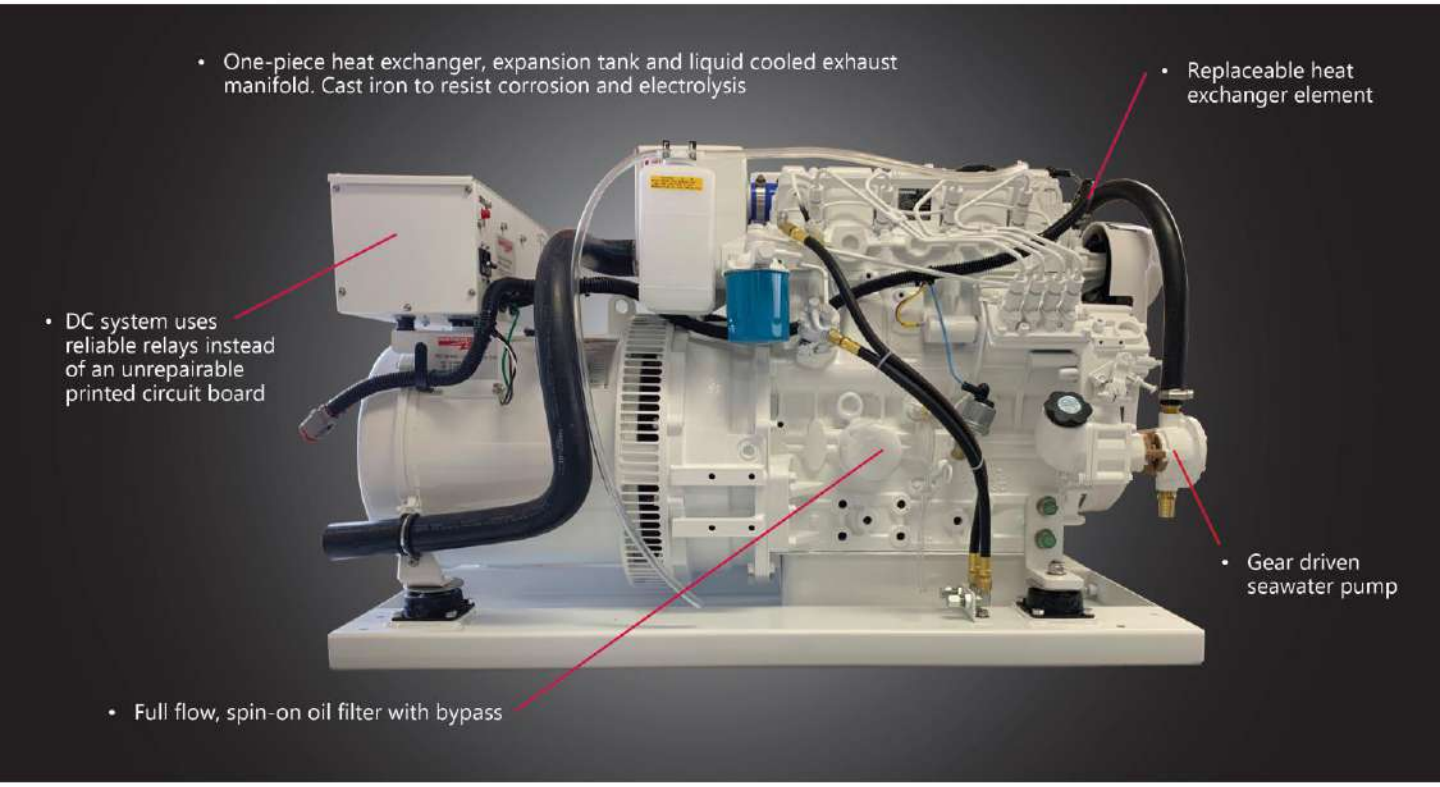
FEATURES AND BENEFITS

Engine Block	Four cycle, 3 cylinder, liquid cooled, naturally aspirated, overhead valve diesel with glow plugs for quick starting. Swirl combustion chambers improve fuel efficiency and reduce smoke.
Cooling System	Standard heat exchanger cooling with optional keel cooling. Copper-nickel, tube-type heat exchanger has removable rubber end caps for easy cleaning, and no need for zincs. The bronze and stainless steel seawater pump with rubber impeller is gear driven, eliminating a potential failure point.
Fuel System	The self-venting fuel system features an inline injection pump with 3-5% mechanical governor for close AC frequency control. Stop solenoid acts directly on the fuel rack eliminating external linkage problems. The fuel lift pump is mechanical with a hand primer, eliminating electronic pump failures.
Intake and Exhaust	The M843NW3G meets US EPA Tier III emission standards. Its cast aluminum intake manifold with Sound Maze system reduces noise, and its washable air cleaner makes routine maintenance simple. The wet exhaust elbow is stainless steel.
Lubrication System	The closed crankcase vent system traps oil vapor and keeps engine room clean. 4.2 qt (4.0 ltr) oil capacity for better lubrication and 200 hour oil change intervals. Oil drain hose with valve plumbed to base pan as standard.
DC Electrical System	The DC System features a 12 volt starter motor and battery charging alternator with belt guard. The set is equipped with a standard remote mount control panel, featuring an hour meter, stop-start switch with run light and a preheat switch, and includes a 20 foot (6m) harness. The standard panel can be expanded to six panels, up to 110 feet from the set. Low oil pressure, high coolant temperature and high exhaust temperature safety shutdowns are standard.
AC Generator	The Northern Lights, direct coupled, four pole, four lead generator has Class "H" insulation, a pre-lubricated bearing and features a conservative heat rise rating of 95°C/50°C ambient. Our automatic voltage regulator gives you ±1% voltage regulation. The AVR protected by a dedicated circuit breaker.

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

NORTHERN LIGHTS® MECTRA SYNERGY

M844DW3G
16 kW (60 Hz, 1800 rpm)
14 kW (50 Hz, 1500 rpm)



SPECIFICATIONS AND DIMENSIONS

AC Output[1]

16 KW	60 Hz, 1800 RPM, 1 Ph, 1.0 PF, 120/240 V/67 A, 120 V/133 A
14 KW	50 Hz, 1500 RPM, 1 Ph, 1.0 PF, 220 V/64 A
Optional	Three Phase with 0.8 PF
Voltage regulation	±1%

1. Based on SAE J1995 and ISO 3046.

Weight and Height

Approximate dry weight	948 lbs (430 kg)
Length	43.7 in (1111 mm)
Width	19.5 in (494 mm)
Height	27.5 in (697 mm)
Sound enclosure weight	90 lbs (41 kg)
Enclosure length	46.1 in (1170 mm)
Enclosure width	22.5 in (573 mm)
Enclosure height	28.1 in (714 mm)

Consult factory for classification society.

US EPA Tier III

Engine Data

Type	Vertical inline 4 cylinder diesel
Displacement	135 in³ (2.2 ltr)
Bore/Stroke	3.30/3.90 in (84/100 mm)
HP @ RPM	32/1800 26/1500
Approximate fuel use [2]:	
1800 RPM @ full load	1.70 gph (6.50 lph)
1800 RPM @ half load	1.00 gph (3.90 lph)
1500 RPM @ full load	1.36 gph (5.20 lph)
1500 RPM @ half load	0.80 gph (3.00 lph)

2. Actual fuel consumption will vary depending on operating conditions.

Installation Data

Wet exhaust elbow	2 inch (51 mm) OD
Raw water inlet	3/4 in (19 mm) OD
Fuel inlet and return	1/4 inch NPT

Information and dimensions are subject to change without notice.

NORTHERN LIGHTS

MECTRA SYNERGY

M844DW3G
16 kW (60 Hz, 1800 rpm)
14 kW (50 Hz, 1500 rpm)

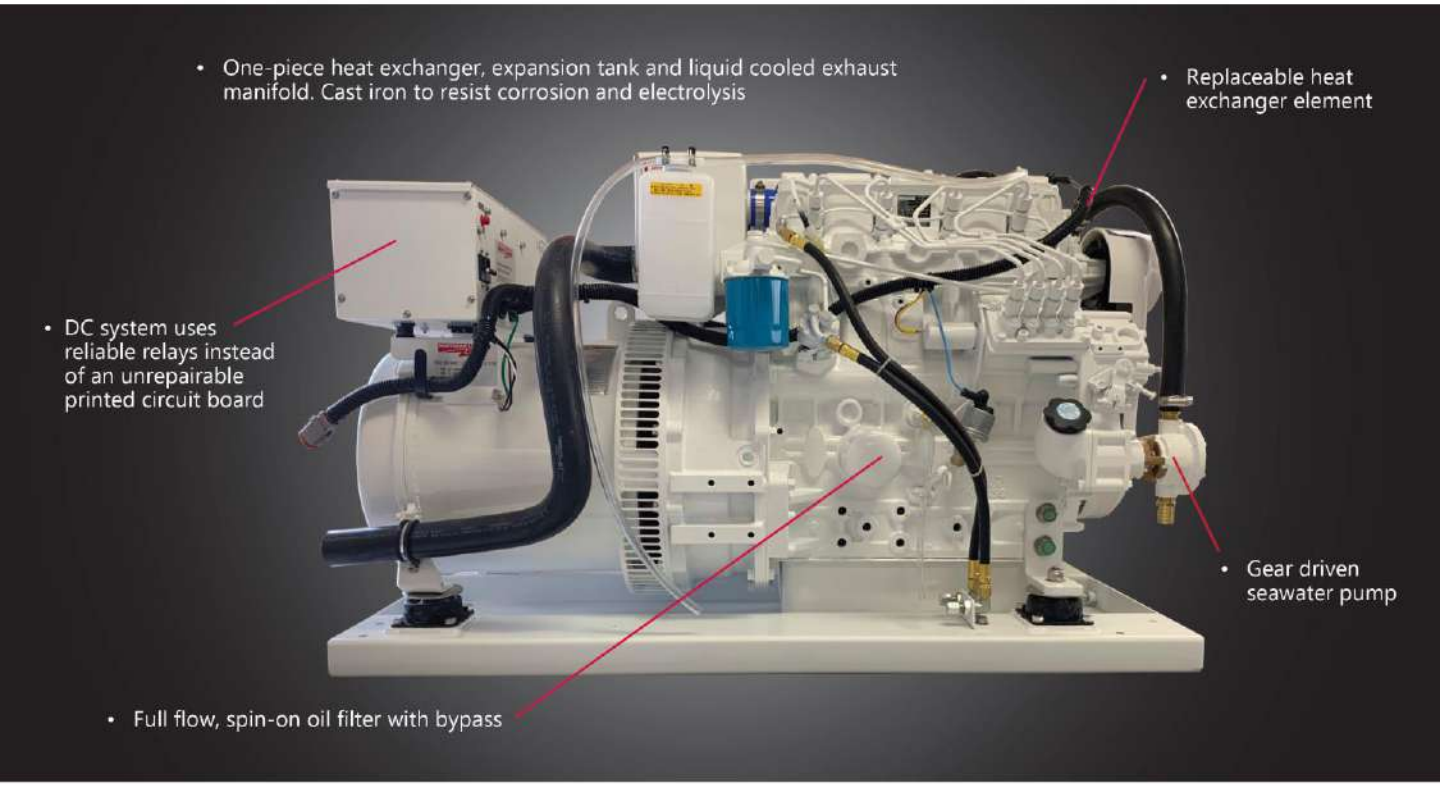
FEATURES AND BENEFITS

Engine Block	Four cycle, 4 cylinder, liquid cooled, naturally aspirated, overhead valve diesel with glow plugs for quick starting. Swirl combustion chambers improve fuel efficiency and reduce smoke.
Cooling System	Standard heat exchanger cooling with optional keel cooling. Copper-nickel, tube-type heat exchanger has removable rubber end caps for easy cleaning, and no need for zincs. The bronze and stainless steel seawater pump with rubber impeller is gear driven, eliminating a potential failure point.
Fuel System	The self-venting fuel system features an inline injection pump with 3-5% mechanical governor for close AC frequency control. Stop solenoid acts directly on the fuel rack eliminating linkage problems. The fuel lift pump is mechanical with a hand primer, eliminating electronic pump failures.
Intake and Exhaust	The M844DW3G meets US EPA Tier III emission standards. Its cast aluminum intake manifold with Sound Maze system reduces noise, and its washable air cleaner makes routine maintenance simple. The wet exhaust elbow is stainless steel.
Lubrication System	The closed crankcase vent system traps oil vapor and keeps engine room clean. 8.6 qt (8.2 ltr) oil capacity for better lubrication and 200 hour oil change intervals. Oil drain hose with valve plumbed to base pan as standard..
DC Electrical System	The DC System features a 12 volt starter motor and battery charging alternator with belt guard. The set is equipped with a standard remote mount control panel, featuring an hour meter, stop-start switch, engine gauges, a preheat switch, and includes a 20 foot (6m) harness. The standard panel can be expanded to six panels, up to 110 feet from the set. Gauges include oil pressure, coolant temperture and DC Voltage. Low oil pressure, high coolant temperature and high exhaust temperature safety shutdowns standard.
AC Generator	The Northern Lights, direct coupled, four pole, four lead generator has Class "H" insulation, a pre-lubricated bearing and features a conservative heat rise rating of 95°C/50°C ambient. Our automatic voltage regulator gives you ±1% voltage regulation. The AVR protected by a dedicated circuit breaker.

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

NORTHERN LIGHTS® MECTRA SYNERGY

M844LW3G
20 kW (60 Hz, 1800 rpm)
16 kW (50 Hz, 1500 rpm)



SPECIFICATIONS AND DIMENSIONS

AC Output[1]

20 KW	60 Hz, 1800 RPM, 1 Ph, 1.0 PF, 120/240 V/83.3 A, 120 V/167 A
16 KW	50 Hz, 1500 RPM, 1 Ph, 1.0 PF, 220 V/72.7 A
Optional	Three Phase with 0.8 PF
Voltage regulation	±1%

1. Based on SAE J1995 and ISO 3046.

Weight and Height

Approximate dry weight	948 lbs (430 kg)
Length	43.7 in (1111 mm)
Width	19.5 in (494 mm)
Height	27.5 in (697 mm)
Sound enclosure weight	90 lbs (41 kg)
Enclosure length	46.0 in (1169 mm)
Enclosure width	22.5 in (573 mm)
Enclosure height	29.5 in (750 mm)

Consult factory for classification society.

US EPA Tier III

Engine Data

Type	Vertical inline 4 cylinder diesel
Displacement	135 in³ (2.2 ltr)
Bore/Stroke	3.30/3.90 in (84/100 mm)
HP @ RPM	32/1800 26/1500
Approximate fuel use [2]:	
1800 RPM @ full load	1.70 gph (6.50 lph)
1800 RPM @ half load	1.00 gph (3.90 lph)
1500 RPM @ full load	1.36 gph (5.20 lph)
1500 RPM @ half load	0.80 gph (3.00 lph)

2. Actual fuel consumption will vary depending on operating conditions.

Installation Data

Wet exhaust elbow	2 inch (51 mm) OD
Raw water inlet	3/4 in (19 mm) OD
Fuel inlet	5/16 - 37T JIC
Fuel return	1/4 - 37T JIC

Information and dimensions are subject to change without notice.

NORTHERN LIGHTS

MECTRA SYNERGY

M844LW3G
20 kW (60 Hz, 1800 rpm)
16 kW (50 Hz, 1500 rpm)

FEATURES AND BENEFITS

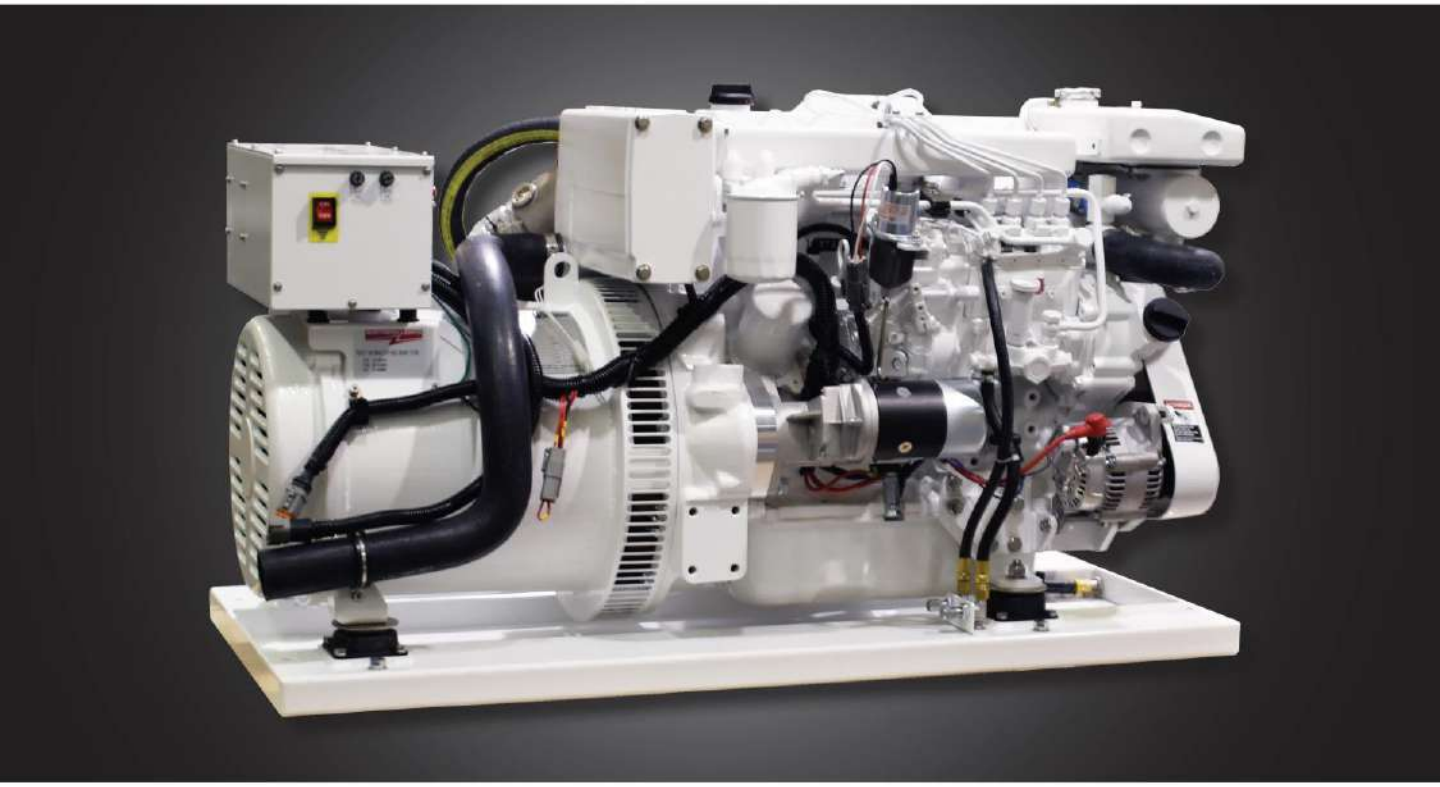
Engine Block	Four cycle, 4 cylinder, liquid cooled, naturally aspirated, overhead valve diesel with glow plugs for quick starting. Swirl combustion chambers improve fuel efficiency and reduce smoke.
Cooling System	Standard heat exchanger cooling with optional keel cooling. Copper-nickel, tube-type heat exchanger has removable rubber end caps for easy cleaning, and no need for zincs. The bronze and stainless steel seawater pump with rubber impeller is gear driven, eliminating a potential failure point.
Fuel System	The self-venting fuel system features an inline injection pump with 3-5% mechanical governor for close AC frequency control. Stop solenoid acts directly on the fuel rack eliminating linkage problems. The fuel lift pump is mechanical with a hand primer, eliminating electronic pump failures.
Intake and Exhaust	The M844LW3G meets US EPA Tier III emission standards. Its cast aluminum intake manifold with Sound Maze system reduces noise, and its washable air cleaner makes routine maintenance simple. The wet exhaust elbow is stainless steel.
Lubrication System	The closed crankcase vent system traps oil vapor and keeps engine room clean. 8.6 qt (8.2 ltr) oil capacity for better lubrication and 200 hour oil change intervals. Oil drain hose with valve plumbed to base pan as standard.
DC Electrical System	The DC System features a 12 volt starter motor and battery charging alternator with belt guard. The set is equipped with a standard remote mount control panel, featuring an hour meter, stop-start switch, engine gauges, a preheat switch, and includes a 20 foot (6m) harness. The standard panel can be expanded to six panels, up to 110 feet from the set. Gauges include oil pressure, coolant temperture and DC Voltage. Low oil pressure, high coolant temperature and high exhaust temperature safety shutdowns standard.
AC Generator	The Northern Lights, direct coupled, four pole, four lead generator has Class "H" insulation, a pre-lubricated bearing and features a conservative heat rise rating of 95°C/50°C ambient. Our automatic voltage regulator gives you ±1% voltage regulation. The AVR protected by a dedicated circuit breaker.

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

NORTHERN LIGHTS MECTRA SYNERGY

M864W3G

25 kW (60 Hz, 1800 rpm)
20 kW (50 Hz, 1500 rpm)



SPECIFICATIONS AND DIMENSIONS

AC Output[1]

25 KW	60 Hz, 1800 RPM, 1 Ph, 1.0 PF, 120/240 V/104.1 A, 120 V/208.3 A
20 KW	50 Hz, 1500 RPM, 1 Ph, 1.0 PF, 220 V/90.9 A
Reconnectable to	Three Phase with 0.8 PF
Voltage regulation	±1%

1. Based on SAE J1995 and ISO 3046.

Weight and Height

Approximate dry weight	968 lbs (439 kg)
Length	46.7 in (1187 mm)
Width	21.6 in (549 mm)
Height	26.6 in (677 mm)
Sound enclosure weight	55 lbs (25 kg)
Enclosure length	48.9 in (1243 mm)
Enclosure width	25.0 in (635 mm)
Enclosure height	27.8 in (706 mm)

Engine Data

Type	Vertical inline 4 cylinder diesel
Displacement	152 in³ (2.5 ltr)
Bore/Stroke	3.40/4.20 in (86/107 mm)
HP @ RPM	39/1800 33/1500
Approximate fuel use [2]:	
1800 RPM @ full load	2.23 gph (8.40 lph)
1800 RPM @ half load	1.17 gph (4.40 lph)
1500 RPM @ full load	1.78 gph (6.73 lph)
1500 RPM @ half load	0.93 gph (3.52 lph)

2. Actual fuel consumption will vary depending on operating conditions.

Installation Data

Wet exhaust elbow	3 inch (76 mm) OD
Raw water inlet	3/4 in (19 mm) OD
Fuel inlet	5/16 - 37T JIC
Fuel return	1/4 - 37T JIC

Consult factory for classification society.

US EPA Tier III

Information and dimensions are subject to change without notice.

NORTHERN LIGHTS® MECTRA SYNERGY

M864W3G
25 kW (60 Hz, 1800 rpm)
20 kW (50 Hz, 1500 rpm)

FEATURES AND BENEFITS

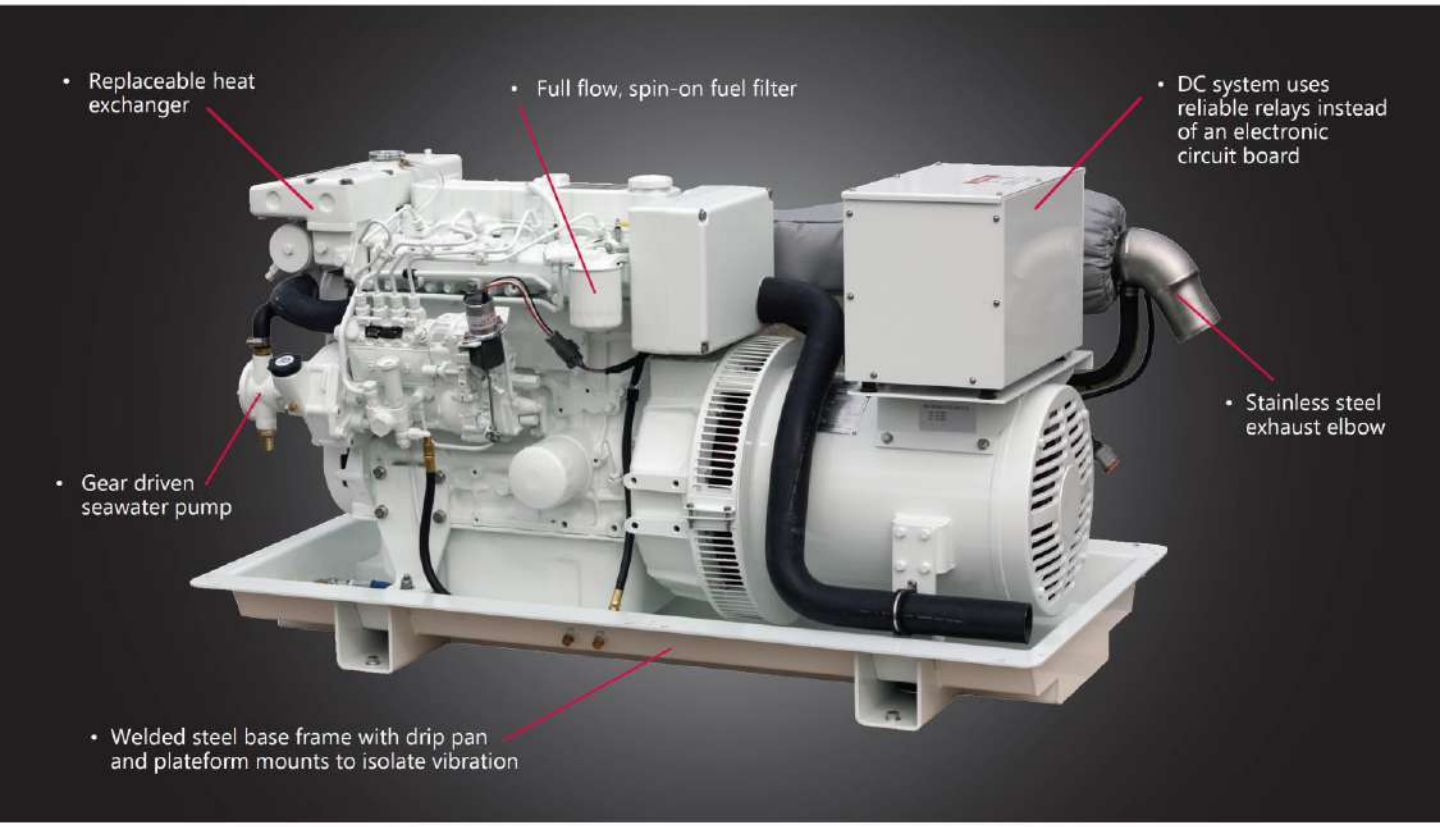
Engine Block	Four cycle, 4 cylinder, liquid cooled, naturally aspirated, overhead valve diesel with glow plugs for quick starting. The forged carbon-steel crankshaft is stronger than cast iron whole the cross flow head makes for more efficient breathing. Helical cut gear train reduces noise.
Cooling System	Standard heat exchanger cooling with optional keel cooling. Copper-nickel, tube-type heat exchanger has removable end caps for easy cleaning. Electrolysis protection via zinc anode. The bronze and stainless steel seawater pump with rubber impeller is gear driven, eliminating a potential failure point.
Fuel System	The self-venting fuel system features an inline injection pump with 3-5% mechanical governor for close AC frequency control. The fuel lift pump is mechanical with a hand primer, eliminating electronic pump failures.
Intake and Exhaust	The M864W3 meets US EPA Tier III emission standards. Its cast aluminum intake manifold with Sound Maze system reduces noise, and its washable air cleaner makes routine maintenance simple. The wet exhaust elbow is stainless steel.
Lubrication System	The closed crankcase vent system traps oil vapor and keeps engine room clean. 6.9 qt (6.5 ltr) oil capacity for better lubrication and 200 hour oil change intervals. Oil drain hose with valve plumbed to base pan as standard.
DC Electrical System	The DC System features a 12 volt starter motor and battery charging alternator with belt guard. The set is equipped with a standard remote mount control panel, featuring an hour meter, stop-start switch, engine gauges, a preheat switch, and includes a 20 foot (6m) harness. The standard panel can be expanded to six panels, up to 110 feet from the set. Gauges include oil pressure, coolant temperture and DC Voltage. Low oil pressure, high coolant temperature and high exhaust temperature safety shutdowns standard.
AC Generator	The Northern Lights, direct coupled, four pole, twelve lead reconnectable generator has Class "H" insulation, a pre-lubricated bearing and features a conservative heat rise rating of 95°C/50°C ambient. Our automatic voltage regulator gives you ±1% voltage regulation. The AVR protected by a dedicated circuit breaker.

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

NORTHERN LIGHTS®

M:CTRA SYNERGY

M944W3F
30 kW (60 Hz, 1800 rpm)



SPECIFICATIONS AND DIMENSIONS

AC Output[1]

30 KW	60 Hz, 1800 RPM, 1 Ph, 1.0 PF, 120/240 V/125 A, 120 V/250 A
Optional	Three Phase with 0.8 PF (Not Reconnectable)
Voltage regulation	±1%

1. Based on SAE J1995 and ISO 3046.

Weight and Height

Approximate wet weight	1361 lbs (617 kg)
Length	59.1 in (1501 mm)
Width	29.0 in (737 mm)
Height	30.7 in (779 mm)
Sound enclosure weight	158 lbs (72 kg)
Enclosure length	56.0 in (1422 mm)
Enclosure width	29.0 in (737 mm)
Enclosure height	31.5 in (800 mm)

Engine Data

Type	Vertical inline 4 cylinder diesel
Displacement	203 in^3 (3.3 ltr)
Bore/Stroke	3.70/4.72 in (94/120 mm)
HP @ RPM	43.5/1800
Approximate fuel use [2]:	
1800 RPM @ full load	2.80 gph (9.80 lph)
1800 RPM @ half load	1.50 gph (5.30 lph)

2. Actual fuel consumption will vary depending on operating conditions.

Installation Data

Wet exhaust elbow	3 inch (76 mm) OD
Raw water inlet	3/4 in (19 mm) OD
Fuel inlet and return	1/4 inch NPT

Consult factory for classification society.

US EPA TIER III

Information and dimensions are subject to change without notice.

NORTHERN LIGHTS

MECTRA SYNERGY

M944W3F
30 kW (60 Hz, 1800 rpm)

FEATURES AND BENEFITS

Engine Block	Four cycle, 4 cylinder, liquid cooled, naturally aspirated, overhead valve diesel with glow plugs for quick starting. The forged carbon-steel crankshaft is stronger than cast iron while the cross flow head makes for efficient combustion. Helical cut gear train reduces noise.
Cooling System	Standard heat exchanger cooling with optional keel cooling. Copper-nickel, tube-type heat exchanger has removable end caps for easy cleaning. Electrolysis protection via zinc anode. The bronze and stainless steel seawater pump with rubber impeller is gear driven, eliminating a potential failure point.
Fuel System	The self-venting fuel system features an inline injection pump with 3-5% mechanical governor for close AC frequency control. The fuel lift pump is mechanical with a hand primer, eliminating electronic pump failures.
Intake and Exhaust	The M944W3F has a stainless steel wet exhaust elbow.
Lubrication System	The closed crankcase vent system traps oil vapor and keeps engine room clean. 10.5 qt (10 ltr) oil capacity for better lubrication and 250 hour oil change intervals. Oil drain hose with valve plumbed to base pan as standard.
DC Electrical System	The DC System features a 12 volt starter motor and battery charging alternator with belt guard. The set is equipped with a standard remote mount control panel, featuring an hour meter, stop-start switch, engine gauges, a preheat switch, and includes a 20 foot (6m) harness. The standard panel can be expanded to six panels, up to 110 feet from the set. Gauges include oil pressure, coolant temperture and DC Voltage. Low oil pressure, high coolant temperature and high exhaust temperature safety shutdowns standard.
AC Generator	The Northern Lights, direct coupled, four pole, four lead generator has Class "H" insulation, a pre-lubricated bearing and features a conservative heat rise rating of 95°C/50°C ambient. Our external automatic voltage regulator is powered by a dedicated AC winding for true 300% short circuit protection.

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

NORTHERN LIGHTS® MECTRA SYNERGY

M944W3

30 kW (60 Hz, 1800 rpm)
26 kW (50 Hz, 1500 rpm)

SPECIFICATIONS AND DIMENSIONS

AC Output[1]

30 KW	60 Hz, 1800 RPM, 1 Ph, 1.0 PF, 120/240 V/125 A, 120 V/250 A
26 KW	50 Hz, 1500 RPM, 1 Ph, 1.0 PF, 220 V/118 A
Optional	Three Phase with 0.8 PF
Voltage regulation	±1%

1. Based on SAE J1995 and ISO 3046.

Weight and Height

Approximate wet weight	1351 lbs (613 kg)
Length	56.0 in (1422 mm)
Width	29.0 in (737 mm)
Height	30.7 in (779 mm)
Sound enclosure weight	158 lbs (72 kg)
Enclosure length	56.0 in (1422 mm)
Enclosure width	29.0 in (737 mm)
Enclosure height	31.5 in (800 mm)

Consult factory for classification society.

Engine Data

Type	Vertical inline 4 cylinder diesel
Displacement	203 in³ (3.3 ltr)
Bore/Stroke	3.70/4.72 in (94/120 mm)
HP @ RPM	49/1800 39/1500
Approximate fuel use [2]:	
1800 RPM @ full load	2.80 gph (9.80 lph)
1800 RPM @ half load	1.50 gph (5.30 lph)
1500 RPM @ full load	2.30 gph (7.41 lph)
1500 RPM @ half load	1.20 gph (4.16 lph)

2. Actual fuel consumption will vary depending on operating conditions.

Installation Data

Wet exhaust elbow	3 inch* (76 mm) ID
Raw water inlet	3/4 in (19 mm) ID
Fuel inlet and return	1/4 inch NPT

Information and dimensions are subject to change without notice.
**Consult factory for additional exhaust requirements*

NORTHERN LIGHTS

MECTRA SYNERGY

M944W3
30 kW (60 Hz, 1800 rpm)
26 kW (50 Hz, 1500 rpm)

FEATURES AND BENEFITS

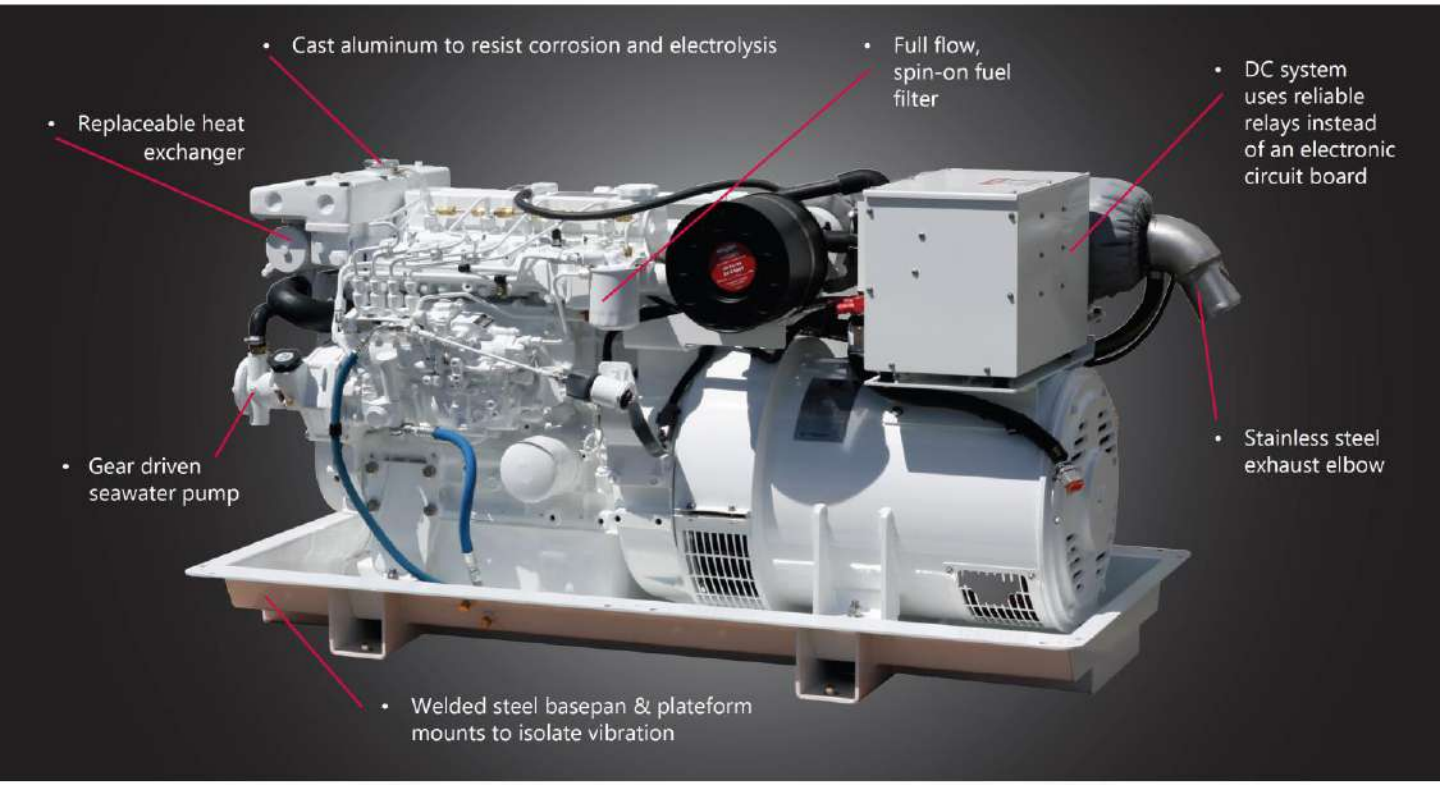
Engine Block	Four cycle, 4 cylinder, liquid cooled, naturally aspirated, overhead valve diesel with glow plugs for quick starting. The forged carbon-steel crankshaft is stronger than cast iron while the cross flow head makes for efficient combustion. Helical cut gear train reduces noise.
Cooling System	Standard heat exchanger cooling with optional keel cooling. Copper-nickel, tube-type heat exchanger has removable end caps for easy cleaning. Electrolysis protection via zinc anode. The bronze and stainless steel seawater pump with rubber impeller is gear driven, eliminating a potential failure point.
Fuel System	The self-venting fuel system features an inline injection pump with 3-5% mechanical governor for close AC frequency control. The fuel lift pump is mechanical with a hand primer, eliminating electronic pump failures.
Intake and Exhaust	The M944W3 meets US EPA Tier II/IMO II emission standards. The wet exhaust elbow is stainless steel.
Lubrication System	The closed crankcase vent system traps oil vapor and keeps engine room clean. 10.5 qt (10 ltr) oil capacity for better lubrication and 250 hour oil change intervals. Oil drain hose with valve plumbed to base pan as standard.
DC Electrical System	The DC System features a 12 volt starter motor and battery charging alternator with belt guard. The set is equipped with a standard remote mount control panel, featuring an hour meter, stop-start switch, engine gauges, a preheat switch, and includes a 20 foot (6m) harness. The standard panel can be expanded to six panels, up to 110 feet from the set. Gauges include oil pressure, coolant temperture and DC Voltage. Low oil pressure, high coolant temperature and high exhaust temperature safety shutdowns standard.
AC Generator	The Northern Lights, direct coupled, four pole, four lead generator has Class "H" insulation, a pre-lubricated bearing and features a conservative heat rise rating of 95°C/50°C ambient. Our external automatic voltage regulator is powered by a dedicated AC winding for true 300% short circuit protection.

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

NORTHERN LIGHTS® MECTRA SYNERGY

M944T3F

38 kW (60 Hz, 1800 rpm, 1ph)
40 kW (60 Hz, 1800 rpm, 3ph)



SPECIFICATIONS AND DIMENSIONS

AC Output[1]

38 KW	60 Hz, 1800 RPM 1 Phase: 120/240 VAC, 158.3 A, 120V/316.6 A
40 KW	3 Phase: 120/208 VAC, 139 A
Optional	Three phase with 0.8 PF
Voltage regulation	±1%

1. Based on SAE J1995 and ISO 3046.

Weight and Height

Approximate dry weight	1480 lbs (671 kg)
Length	63.1 in (1602 mm)
Width	29.0 in (737 mm)
Height	30.5 in (775 mm)
Sound enclosure weight	140 lbs (64 kg)
Enclosure length	60.0 in (1524 mm)
Enclosure width	29.0 in (737 mm)
Enclosure height	32.0 in (813 mm)

Engine Data

Type	Vertical inline 4 cylinder diesel
Displacement	203 in^3 (3.3 ltr)
Bore/Stroke	3.70/4.72 in (94/120 mm)
Aspiration	Turbocharged
HP @ RPM	60/1800
Approximate fuel use [2]:	
1800 RPM @ full load	3.26 gph (12.34 lph)
1800 RPM @ half load	1.60 gph (6.05 lph)
1500 RPM @ full load	2.33 gph (8.82 lph)
1500 RPM @ half load	1.33 gph (5.03 lph)

2. Actual fuel consumption will vary depending on operating conditions.

Installation Data

Wet exhaust elbow	3 inch* (76 mm) ID
Raw water inlet	3/4 in (19 mm) ID
Fuel inlet and return	1/4 inch NPT

Consult factory for classification society.

US EPA Tier III

Information and dimensions are subject to change without notice.

**Consult factory for additional exhaust requirements*

NORTHERN LIGHTS®

MECTRA SYNERGY

M944T3F
38 kW (60 Hz, 1800 rpm, 1ph)

FEATURES AND BENEFITS

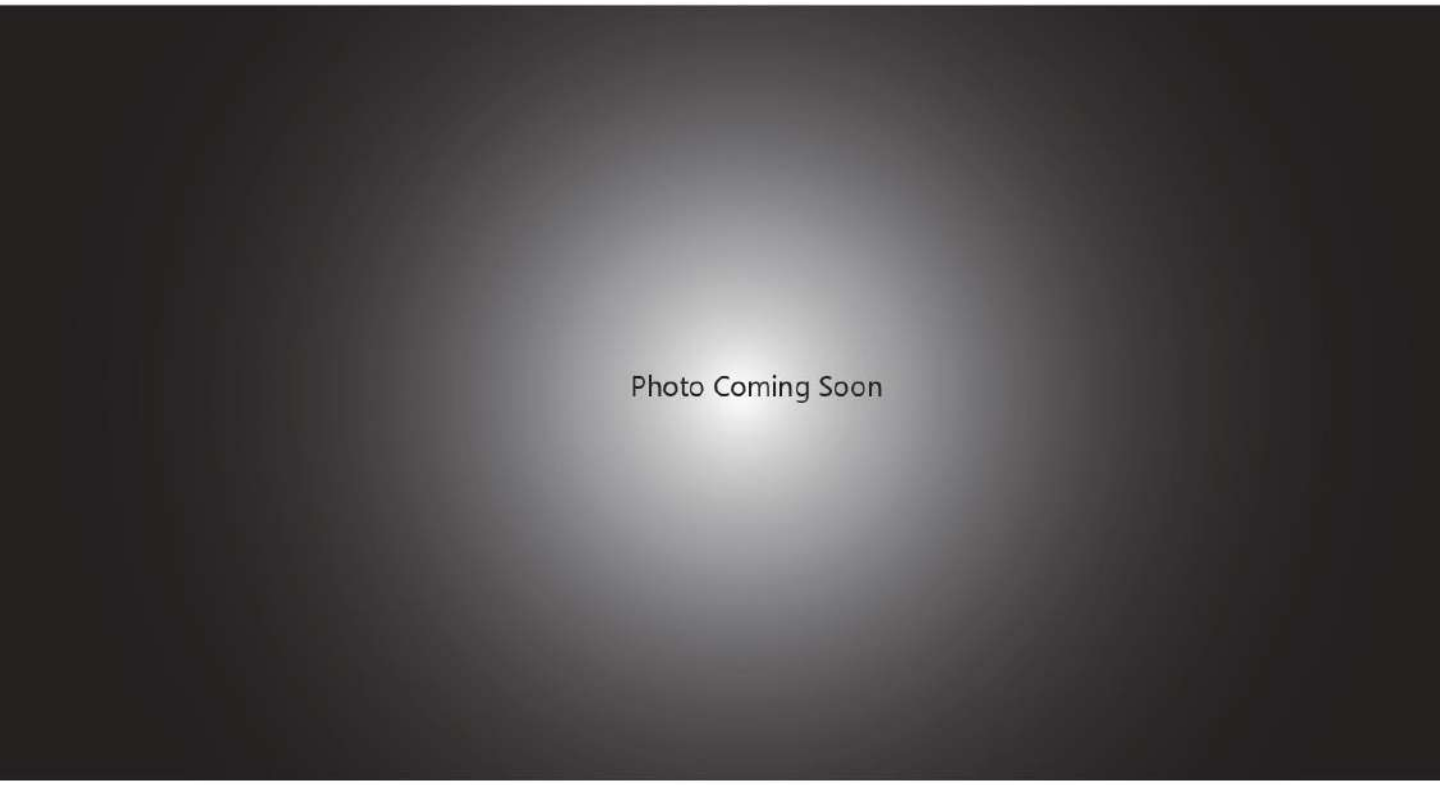
Engine Block	Four cycle, 4 cylinder, liquid cooled, turbo charged, overhead valve diesel. The induction hardened, forged carbon-steel crankshaft is stronger than cast iron while the cross flow head makes for efficient combustion. Helical cut gear train reduces noise.
Cooling System	Standard heat exchanger cooling with optional keel cooling. Copper-nickel, tube-type heat exchanger has removable end caps for easy cleaning. Electrolysis protection via zinc anode. The bronze and stainless steel seawater pump with rubber impeller is gear driven, eliminating a potential failure point.
Fuel System	The self-venting fuel system features an inline injection pump with 3-5% mechanical governor for close AC frequency control. The fuel lift pump is mechanical with a hand primer, eliminating electronic pump failures.
Intake and Exhaust	The M944T3F has a stainless steel wet exhaust elbow.
Lubrication System	The closed crankcase vent system traps oil vapor and keeps engine room clean. 10.5 qt (10 ltr) oil capacity for better lubrication and 250 hour oil change intervals. Oil drain hose with valve plumbed to base pan as standard.
DC Electrical System	The DC System features a 12 volt starter motor and battery charging alternator with belt guard. The set is equipped with a standard remote mount control panel, featuring an hour meter, stop-start switch, engine gauges, a preheat switch, and includes a 20 foot (6m) harness. The standard panel can be expanded to six panels, up to 110 feet from the set. Gauges include oil pressure, coolant temperture and DC Voltage. Low oil pressure, high coolant temperature and high exhaust temperature safety shutdowns standard.
AC Generator	The Northern Lights, direct coupled, four pole, twelve lead generator has Class "H" insulation, a pre-lubricated bearing and features a conservative heat rise rating of 95°C/50°C ambient. Our external automatic voltage regulator is powered by a dedicated AC winding for true 300% short circuit protection.

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

NORTHERN LIGHTS MECTRA SYNERGY

M944TG

38 kW (60 Hz, 1800 rpm)
32 kW (50 Hz, 1500 rpm)



SPECIFICATIONS AND DIMENSIONS

AC Output[1]

38 KW	60 Hz, 1800 RPM 120/240 V/158.3 A, 120 V/316.6 A
32 KW	50 Hz, 1500 RPM 220 V/145 A
Optional	Three phase with 0.8 PF
Voltage regulation	±1%

1. Based on SAE J1995 and ISO 3046.

Weight and Height

Approximate dry weight	1450 lbs (657 kg)
Length	60.0 in (1524 mm)
Width	29.0 in (737 mm)
Height	30.5 in (775 mm)
Sound enclosure weight	140 lbs (64 kg)
Enclosure length	60.1 in (1527 mm)
Enclosure width	28.7 in (729 mm)
Enclosure height	32.0 in (813 mm)

Consult factory for classification society.

Engine Data

Type	Vertical inline 4 cylinder diesel
Displacement	203 in³ (3.3 ltr)
Bore/Stroke	3.70/4.72 in (94/120 mm)
Aspiration	Turbocharged
HP @ RPM	60/1800 50/1500
Approximate fuel use [2]:	
1800 RPM @ full load	3.26 gph (12.34 lph)
1800 RPM @ half load	1.60 gph (6.05 lph)
1500 RPM @ full load	2.33 gph (8.82 lph)
1500 RPM @ half load	1.33 gph (5.03 lph)

2. Actual fuel consumption will vary depending on operating conditions.

Installation Data

Wet exhaust elbow	3 inch (76 mm) OD
Raw water inlet	3/4 in (19 mm) OD
Fuel inlet	5/16 - 37T JIC
Fuel return	1/4 - 37T JIC

Information and dimensions are subject to change without notice.

NORTHERN LIGHTS

MECTRA SYNERGY

M944TG
38 kW (60 Hz, 1800 rpm, 3ph)
32 kW (60 Hz, 1800 rpm, 1ph)

FEATURES AND BENEFITS

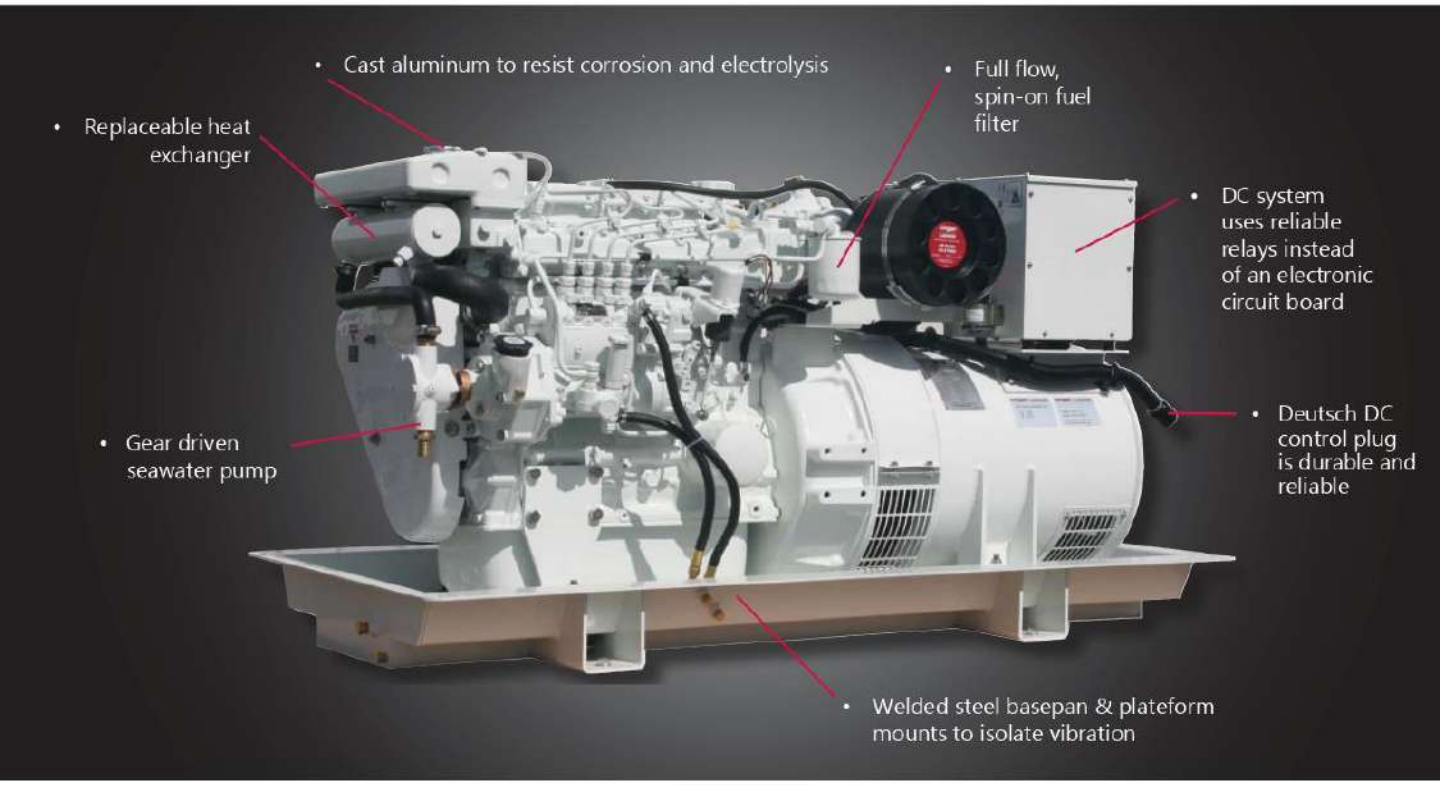
Engine Block	Four cycle, 4 cylinder, liquid cooled, turbo charged, overhead valve diesel. The induction hardened, forged carbon-steel crankshaft is stronger than cast iron while the cross flow head makes for efficient combustion. Helical cut gear train reduces noise.
Cooling System	Standard heat exchanger cooling with optional keel cooling. Copper-nickel, tube-type heat exchanger has removable end caps for easy cleaning. Electrolysis protection via zinc anode. The bronze and stainless steel seawater pump with rubber impeller is gear driven, eliminating a potential failure point.
Fuel System	The self-venting fuel system features an inline injection pump with 3-5% mechanical governor for close AC frequency control. The fuel lift pump is mechanical with a hand primer, eliminating electronic pump failures.
Intake and Exhaust	The M944TG meets US EPA Tier II/IMO II emission standards. The wet exhaust elbow is stainless steel.
Lubrication System	The closed crankcase vent system traps oil vapor and keeps engine room clean. 10.5 qt (10 ltr) oil capacity for better lubrication and 250 hour oil change intervals. Oil drain hose with valve plumbed to base pan as standard.
DC Electrical System	The DC System features a 12 volt starter motor and battery charging alternator with belt guard. The set is equipped with a standard remote mount control panel, featuring an hour meter, stop-start switch, engine gauges, a preheat switch, and includes a 20 foot (6m) harness. The standard panel can be expanded to six panels, up to 110 feet from the set. Gauges include oil pressure, coolant temperture and DC Voltage. Low oil pressure, high coolant temperature and high exhaust temperature safety shutdowns standard.
AC Generator	The Northern Lights, direct coupled, four pole, twelve lead generator has Class "H" insulation, a pre-lubricated bearing and features a conservative heat rise rating of 95°C/50°C ambient. Our external automatic voltage regulator is powered by a dedicated AC winding for true 300% short circuit protection.

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

NORTHERN LIGHTS

MECTRA SYNERGY

M944T
38 kW (60 Hz, 1800 rpm)
32 kW (50 Hz, 1500 rpm)



SPECIFICATIONS AND DIMENSIONS

AC Output[1]

38 KW	60 Hz, 1800 RPM 120/240 V/158.3 A, 120 V/316.6 A
32 KW	50 Hz, 1500 RPM 220 V/145 A
Optional	Three phase with 0.8 PF
Voltage regulation	±1%

1. Based on SAE J1995 and ISO 3046.

Weight and Height

Approximate dry weight	1450 lbs (657 kg)
Length	60.0 in (1524 mm)
Width	29.0 in (737 mm)
Height	30.5 in (775 mm)
Sound enclosure weight	140 lbs (64 kg)
Enclosure length	60.0 in (1524 mm)
Enclosure width	29.0 in (737 mm)
Enclosure height	32.0 in (813 mm)

Engine Data

Type	Vertical inline 4 cylinder diesel
Displacement	203 in³ (3.3 ltr)
Bore/Stroke	3.70/4.72 in (94/120 mm)
Aspiration	Turbocharged
HP @ RPM	60/1800 50/1500
Approximate fuel use [2]:	
1800 RPM @ full load	3.26 gph (12.34 lph)
1800 RPM @ half load	1.60 gph (6.05 lph)
1500 RPM @ full load	2.33 gph (8.82 lph)
1500 RPM @ half load	1.33 gph (5.03 lph)

2. Actual fuel consumption will vary depending on operating conditions.

Installation Data

Wet exhaust elbow	3 inch (76 mm) OD
Raw water inlet	3/4 in (19 mm) OD
Fuel inlet and return	1/4 inch NPT

Consult factory for classification society.

Information and dimensions are subject to change without notice.

NORTHERN LIGHTS

MECTRA SYNERGY

M944T
38 kW (60 Hz, 1800 rpm, 3ph)
32 kW (60 Hz, 1800 rpm, 1ph)

FEATURES AND BENEFITS

Engine Block	Four cycle, 4 cylinder, liquid cooled, turbo charged, overhead valve diesel. The induction hardened, forged carbon-steel crankshaft is stronger than cast iron while the cross flow head makes for efficient combustion. Helical cut gear train reduces noise.
Cooling System	Standard heat exchanger cooling with optional keel cooling. Copper-nickel, tube-type heat exchanger has removable end caps for easy cleaning. Electrolysis protection via zinc anode. The bronze and stainless steel seawater pump with rubber impeller is gear driven, eliminating a potential failure point.
Fuel System	The self-venting fuel system features an inline injection pump with 3-5% mechanical governor for close AC frequency control. The fuel lift pump is mechanical with a hand primer, eliminating electronic pump failures.
Intake and Exhaust	The M944T meets US EPA Tier II/IMO II emission standards. The wet exhaust elbow is stainless steel.
Lubrication System	The closed crankcase vent system traps oil vapor and keeps engine room clean. 10.5 qt (10 ltr) oil capacity for better lubrication and 250 hour oil change intervals. Oil drain hose with valve plumbed to base pan as standard.
DC Electrical System	The DC System features a 12 volt starter motor and battery charging alternator with belt guard. The set is equipped with a standard remote mount control panel, featuring an hour meter, stop-start switch, engine gauges, a preheat switch, and includes a 20 foot (6m) harness. The standard panel can be expanded to six panels, up to 110 feet from the set. Gauges include oil pressure, coolant temperture and DC Voltage. Low oil pressure, high coolant temperature and high exhaust temperature safety shutdowns standard.
AC Generator	The Northern Lights, direct coupled, four pole, twelve lead generator has Class "H" insulation, a pre-lubricated bearing and features a conservative heat rise rating of 95°C/50°C ambient. Our external automatic voltage regulator is powered by a dedicated AC winding for true 300% short circuit protection.

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

NORTHERN LIGHTS®

MECTRA SYNERGY

M1064 SERIES

40 - 99 kW, 60 Hz @ 1800 RPM
33 - 90 kW, 50 Hz @ 1500 RPM

FEATURES AND BENEFITS

AFTERCOOLED FOR HIGH POWER DENSITY

Northern Lights M1064A and H models have an aftercooler that cools the intake air. Cool air has more oxygen for better combustion. This aftercooler and electronic fuel injection increase output to give you six cylinder power from a four cylinder set.

SUPERIOR PMG GENERATOR ENDS

Northern Lights generator ends achieve ±0.5% voltage regulation. All have low temperature rise ratings to meet or exceed marine requirements. M1064A and H models have Permanent Magnet Generators for 300% short circuit capability required for classed vessels.

ELECTRONIC SYSTEM PROFILER

The Electronic System Profiler or "ESP" is a window to your set's real-time operating condition. The ECU that controls the electronic fuel injection gives you a SAE J1939 data stream of engine information that can be shown on an optional system monitor panel.

COMMITTED TO PROVIDING COMPLETE SOLUTIONS

Northern Lights generator sets are thoroughly factory tested and go through a complete quality control program to ensure your total satisfaction Our design philosophy allows us to provide comprehensive solutions to your power production needs. Because engine room space is always at a premium, Northern Lights offers Low-Profile generator sets that save valuable inches where you need it most. Our line of options and accessories are designed to integrate into a total power system specifically built for your vessel. PTO's, sound enclosures and custom panels are among the options that make your power system as unique as your boat.

COMPONENT SPECIFIC FEATURES

ENGINE BLOCK

- Lugger four cylinder, four cycle, in-line, liquid cooled, overhead valve, marine diesels based on heavy-duty industrial engine blocks.
- Balanced, forged crankshaft with induction hardened journals and rolled fillets.
- Bimetallic valves have chrome stems and rotators.
- Replaceable valve seats and guides.
- Three ring aluminum alloy pistons with Ni-Resist insert for the top ring. Keystone piston ring reduces carbon buildup under light loads.
- Dual gear-driven, counter-rotating balancing shafts for smooth operation.
- Eight groove poly-vee drive belt powers the alternator and freshwater pump.
- Replaceable, wet cylinder liners for long life and low rebuild costs.

FUEL SYSTEM

- Direct fuel injection systems
- Ring clamp fuel filter with air bleed and drain.
- Diaphragm-type, mechanically driven fuel transfer pump with manual priming lever.
- Flexible fuel lines routed to fuel manifold on base frame for easy installation of vessel's hard piping.

LUBRICATION SYSTEM

- 500 hour oil change interval when fuel and oil requirements are met.
- Positive displacement gear-type oil pump.
- Full flow, spin-on oil filter.
- Oil spray cooling reduces piston crown temperature for longer life.
- Freshwater, plate-type, full flow oil cooler reduces heat and thermal breakdown of lube oil.
- Large capacity oil pan.
- Floating, cast aluminum, rocker cover traps valve noise and is a closed loop crankcase vent.
- Lube oil drain for easy changes.

COOLING SYSTEM

- Freshwater cooling system has two thermostats for safety and quicker warm-ups.
- Heat exchanger cooling includes: Gear driven, flexible impeller seawater pump. Easy to clean, tube-type heat exchanger is cupro-nickel for long life.
- Cast iron expansion tank with brass filler neck for easy filling.
- Cast-iron exhaust manifold has double pass freshwater flow for even temperature control, fast warm-up and no hot spots.
- Zinc anode electrolysis protection.
- D, T1, T2 available in keel cooled version.

CLASSIFICATION STANDARDS

- Consult factory details

AIR SYSTEM-TURBO AND AFTERCOOLER

- Dry air filter silences intake noise.
- A, and H models have aftercooler with aircraft quality, 70/30 cupro-nickel, two pass element. Oval water tubes are easy to clean and stronger than round tubes. Corrugated air cooling fin design supports tubes better than plate fin type. Seawater piping is cast bronze and stainless steel. Water never touches the cast aluminum air ducts. No gaskets; all components are machined and have o-ring seals. Seawater direct from the gear driven pump, for maximum cooling. Dry bolt hole design protects engine cylinders.
- T1, T2, A, H models are turbocharged to increase output. Turbocharger turbine housings are freshwater cooled for safety.
- M1064H is US EPA Tier III certified.

ESP AND DC ELECTRICAL SYSTEM

- Standard, S-3B remote mount control panel with NEMA enclosure has engine hour meter, coolant temperature gauge, oil pressure gauge, DC voltmeter, start-stop and shutdown bypass switches.
- Low oil pressure and high coolant temperature safety shutdown system.
- Northern Lights ESP supplies SAE J1939 data stream through a CAN bus plug for optional engine monitor.
- Negative ground, 12 volt DC system has circuit breaker, starter motor and battery charging alternator with regulator.
- Reliable relay based DC system is easy to trouble shoot and repair. No "printed circuit board" to fail. Relays allow multiple panel installations up to 110 feet from set. Engine and panel are pre-wired with terminal strips.

AC GENERATOR

- Direct coupled, single bearing, 12 lead, reconnectable AC generator. Maintenance free brushless design.
- Generators have class H insulation, accessible diodes, oversized ball bearings, marine grade shafts and conservative 95°/50° heat rise ratings to meet or exceed class society standards.
- Engines and generators are torsionally matched for long life.
- Automatic voltage regulator gives fast response to electrical load changes. Voltage is regulated to ±0.5% (one half of one percent) over the entire range from no load to full load.
- Isochronous electronic governor for 0% AC frequency droop.
- M1064A and H have PMG (permanent magnet generator) to power AVR for 300% short circuit capability for "classed" vessels. PMG is optional on D, T1, and T2.

SPECIAL EQUIPMENT

- Standard hydrolastic mounts isolate 98% of vibration from hull for owner comfort.
- Welded steel base frame with drip pan. Easy to mount and keep clean.
- Belt guard protects operator even on sets in sound enclosures.
- Sparkling white IMRON® polyurethane paint protects set and provides service visibility.
- Operator's and parts manuals.
- Optional low profile sound enclosure for industry best attenuation in a more compact design.

AC Output※	M1064D*	M1064T1*	M1064T2*	M1064A*	M1064H
60 Hz, 1800 RPM¹ kW	**40 kW**	**55 kW**	**65 kW**	**92 kW**	**99 kW**
50 Hz, 1500 RPM¹ kW	**33 kW**	**50 kW**	**55 kW**	**70 kW**	**90 kW**
Voltage regulation and PMG	±0.5% (PMG opt)	±0.5% (PMG opt)	±0.5% (PMG opt)	±0.5% (PMG Std)	±0.5% (PMG Std)
Frequency droop control	±5%	±5%	Isochronous 0%	Isochronous 0%	Isochronous 0%
Phase and power factor	All Models: three phase-0.8 power factor. Single phase-1.0 (unity) power factor is available on "D, T1, T2"				
Generator full load temperature rise	All Models: 95°C temperature rise at 50°C ambient				
Lugger Diesel Engine Data					
Inline cylinders/Aspiration/Operating cycle	I-4/Natural/4	I-4/Turbo/4	I-4/Turbo/4	I-4/Turbo Aftercooled/4	I-4/Turbo Aftercooled/4
Displacement - cid (liter)	276 (4.5)	276 (4.5)	276 (4.5)	276 (4.5)	276 (4.5)
Bore/Stroke - inches (mm)	4.19/5 (106/127)	4.19/5 (106/127)	4.19/5 (106/127)	4.19/5 (106/127)	4.19/5 (106/127)
HP @ 1800 RPM (1500 RPM) ✓	67 (59)	99 (74)	113 (84)	131 (122)	144 (131)
Max. front power take off HP @ 60 Hz (50 Hz)	60 (50)	90 (75)	102 (83)	131 (100)	144 (131)
Oil capacity with filter - quarts (ltr)	14.3 (13.5)	14.3 (13.5)	14.3 (13.5)	21.6 (20.4)	21.7 (20.5)
Cooling System					
Approx. heat exchanger cooling capacity - gal (ltr)	5.5 (21)	5.5 (21)	5.5 (21)	5.5 (21)	5.5 (21)
Min. seawater inlet/discharge through hull dia. - in (mm)	1.25 (32)	1.25 (32)	1.25 (32)	2 (51)	2 (51)
Sea water pump inlet hose ID - in (mm)	1.25 (32)	1.25 (32)	1.25 (32)	2 (51)	2 (51)
Heat rejection to jacket water - 60 Hz BTU min	2151	3267	4138	3983	4781
50 Hz BTU min	1911	2707	3025	3026	4303
Freshwater pump capacity - 60 Hz - gpm (lpm)	38 (144)	38 (144)	38 (144)	38 (144)	60 (227)
50 Hz - gpm (lpm)	32 (120)	32 (120)	32 (120)	32 (120)	50 (189)
Seawater pump capacity - 60 Hz - gpm (lpm)	24 (91)	24 (91)	24 (91)	42 (159)	42 (159)
50 Hz - gpm (lpm)	20 (76)	20 (76)	20 (76)	35 (133)	35 (133)
Max. seawater pump suction head - in (m)	39 (1)	39 (1)	39 (1)	39 (1)	39 (1)
Consult factory for keel and skin cooler sizing	Contact Factory	Contact Factory	Contact Factory	N/A	N/A
Keel cooler head diameter - in NPT	1.5	1.5	1.5	N/A	N/A
Keel cooler hose ID discharge and suction - in (mm)	2.25 (57)	2.25 (57)	2.25 (57)	N/A	N/A
DC Electrical					
DC starting voltage - standard (optional)	12 (24)	12 (24)	12 (24)	12 (24)	12 (24)
Min battery capacity - amp hr/12V CCA (24V CCA)	200/640 (570)	200/640 (570)	200/640 (570)	200/640 (570)	200/640 (570)
Starter rolling amps @ 0°C - 12VDC (24VDC)	780 (600)	780 (600)	780 (600)	780 (600)	780 (600)
12 Volt battery cable size up to 10 ft (3m)	00	00	00	00	00
Air					
Generator cooling air flow - 60 Hz/cfm (50 Hz/cfm)	700 (575)	700 (575)	700 (575)	700 (575)	700 (575)
Air consumption - 60 Hz - cfm (m^3/m)	127 (3.6)	201 (5.7)	226 (6.4)	274 (7.8)	330 (9.4)
50 Hz - cfm (m^3/m)	85 (2.4)	134 (3.8)	151	226 (6.4)	240 (6.8)
Exhaust gas volume - 60 Hz - cfm (m^3/m)	357 (10.1)	512 (14.5)	618 (17.5)	724 (20.5)	869 (24.6)
50 Hz - cfm (m^3/m)	251 (7.1)	339 (9.5)	508 (14.4)	600 (17)	699 (19.8)
Exhaust gas temp - 60 Hz - F° (C°)	823° (439°)	790° (421°)	815° (435°)	750° (399°)	761° (405°)
50 Hz - F° (C°)	737° (392°)	747° (397°)	746° (397°)	695° (368°)	678° (359°)
Approx. heat radiated to air - 60Hz - BTU/min (50Hz - BTU/min)	328 (271)	451 (410)	533 (451)	754 (656)	861 (738)
Max. Exhaust Back Pressure - inch H_2O (mm H_2O)	48 (1220)	30 (762)	30 (762)	30 (762)	30 (762)
Wet exhaust Elbow OD- in (mm)	4 (100)	4 (100)	4 (100)	4 (100)	Contact Factory
Fuel					
Fuel injection pump type and control	Rotary Mechanical	Rotary Mechanical	Rotary Electronic	Rotary Electronic	HPCR Electronic
Min suction & return line - in (mm)	3/8 (9.5)	3/8 (9.5)	3/8 (9.5)	3/8 (9.5)	3/8 (9.5)
Max fuel transfer pump suction lift - in (mm)	36 (914)	36 (914)	36 (914)	36 (914)	36 (914)
Max fuel flow to transfer pump - gph 60 Hz (50 Hz)	29.9 (28.9)	29.9 (28.9)	21.5 (20.8)	22.7 (21.9)	19.6 (18.1)
Full load fuel returned to tank - gph 60 Hz (50 Hz)	26.6 (26.1)	24.7 (25.1)	15.5 (16.5)	15.8 (14.4)	9.92 (11.0)
Specific fuel consumption max load - 60 Hz/lbs.hp.hr.	0.389	0.369	0.378	0.375	0.364
50 Hz/lbs.hp.hr.	0.360	0.362	0.384	0.384	0.349
Approx. fuel rate ⁂ at 60 Hz full load - gph (lph)	3.29 (12.45)	5.14 (19.45)	6.01 (22.74)	6.92 (26.19)	9.13 (34.58)
50 Hz full load - gph (lph)³	2.74 (10.37)	3.83 (14.49)	4.31	6.59	7.17 (27.13)
Maximum Engine Operating Angle					
Continuous (with separate expansion tank)	All Models - Front Down: 0-5°, (0-10°). Rear Down: 0-12°. Left/Right Down: 0-5°, (0-23°)				
Intermittent (2 minutes)	All Models - Front/Rear Down: 0-30°. Left/Right Down: 0-30°				
Dimensions and Weight - Low ProfileΛ					
Set length⁴ - inch (mm)	75.0 (1905)	75.0 (1905)	75.0 (1905)	77.2 (1960)	77.2 (1960)
Set width⁴ - inch (mm)	38.0 (965)	38.0 (965)	38.0 (965)	38.0 (965)	38.0 (965)
Set height⁴ - inch (mm)	38.2 (970)	38.2 (970)	38.2 (970)	38.4 (975)	38.4 (975)
Approx. dry weight⁴ HE cooling 3 phase - lbs (kg)	2513 (1140)	2513 (1140)	2603 (1181)	2750 (1248)	2750 (1248)
Approx. dry weight⁴ HE cooling 1 phase - lbs (kg)	2603 (1181)	2603 (1181)	2750 (1248)	N/A	N/A
Sound enclosure length⁵ - inch (mm)	75.0 (1905)	75.0 (1905)	75.0 (1905)	77.5 (1969)	77.5 (1969)
Sound enclosure width⁵ - inch (mm)	38.0 (965)	38.0 (965)	38.0 (965)	38.0 (965)	38.0 (965)
Sound enclosure height⁵ - inch (mm)	40.9 (1039)	40.9 (1039)	40.9 (1039)	40.9 (1039)	40.9 (1039)
Sound enclosure⁵ weight - lbs (kg)	336 (152)	336 (152)	336 (152)	336 (152)	336 (152)
Dimensions and Weight - Standard ≈					
Set length⁴ - inch (mm)	64.2 (1630)	67.8 (1722)	67.8 (1722)	75.7 (1923)	75.7 (1923)
Set width⁴ - inch (mm)	31.0 (787)	31.8 (807)	31.8 (807)	32.1 (815)	33.3 (845)
Set height⁴ - inch (mm)	40.2 (1021)	40.2 (1021)	40.2 (1021)	40.6 (1031)	40.6 (1031)

*** - US EPA Tier II; Available for non-US flagged vessels only.**

NOTES:
Contact factory = consult factory representative or www.northern-lights.com for current information

※ Prime kW ratings for 3Ø at 0.8 power factor. Consult factory for deration factors.
✓ Net flywheel hp rating for fully equipped engine at rated speed under SAE J816b.
⁂ Based on prime kW rating at 1800 and 1500 RPM. Fuel rate may vary depending on operating conditions.

Λ Data for units with hydrolastic mounts, heat exchanger cooling and 3 phase generator ends. Dimensions and weight are affected by optional equipment, AC output, phase, exhaust and cooling configuration.
≈ Consult factory for data on enclosures for single phase sets or sets with InSep.

Dimensions are subject to change without notice, they are not intended for installations. Contact a factory representative for the current installation data.

NORTHERN LIGHTS

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

NORTHERN LIGHTS

MECTRA SYNERGY

M50T13L

FEATURES AND BENEFITS

ENGINE BLOCK
- US EPA Tier III compliant.
- Four cylinder, four cycle, in-line, liquid cooled, overhead valve, marine diesels based on heavy-duty industrial engine blocks.
- Balanced, forged crankshaft with induction hardened journals and rolled fillets for long life.
- Replaceable, wet cylinder liners for long life and low rebuild costs.
- Bimetallic valves with chrome stems and rotators.
- Replaceable valve seats and guides.
- Three ring aluminum alloy pistons with Ni-Resist insert for the top ring. Keystone piston ring reduces carbon buildup under light loads.
- A single poly-vee drive belt powers the alternator and jacket-water pump.

FUEL SYSTEM
- High pressure common rail fuel injection for smooth, clean delivery.
- Direct fuel injection system.
- Ring damp fuel filters with air bleed and drain.
- Diaphragm-type, mechanical fuel transfer pump with manual priming lever.

LUBRICATION SYSTEM
- Positive displacement gear-type oil pump.
- Full flow, spin-on oil filter.
- Oil spray cooling reduces piston crown temperature.
- Jacket-water, plate-type, full flow oil cooler reduces heat and prevents lube oil breakdown.
- Large capacity oil pan.
- A closed loop crankcase vent traps oil vapor to keep the engine room clean.

AIR SYSTEM
- Dry air filter silences intake noise.
- Turbocharger with jacket water cooled turbine housing for safety.

COOLING SYSTEM
- Heat exchanger with keel cooled option.
- Gear driven sea water pump with self-priming flexible impeller. Bronze with stainless steel shaft.
- Cast iron expansion tank.
- Two thermostats for quick warm-ups and safety.
- Cast-iron exhaust manifold for reliable temperature control.

ESP AND DC ELECTRICAL SYSTEM
- Negative ground, 12 volt DC system has circuit breaker, starter motor and alternator with regulator.
- Low oil pressure and high coolant temperature safety shutdowns.
- Optional control panels help you specify the amount and type of information required. Comprehensive list of optional alarms and safety shutdowns.
- Optional DC logic system for simplified maintenance.
- Optional pre-wired engine, panel with terminal strips.

AC GENERATOR
- Direct coupled, single bearing, 12 lead, reconnectable AC generator. Maintenance free brushless design.
- All NL generators meet or exceed class society standards with Class "H" insulation, accessible diodes, oversized ball bearings, marine grade shafts and conservative 90°/50° heat rise ratings.
- Engines and generators are torsionally matched for long life.
- Automatic voltage regulator; ±0.5% regulation over the entire range from no load to full load.
- Configured for 0% isochronous droop with integral electronic governor control supplied by ECU.

SPECIAL EQUIPMENT
- PMG option for 300% short circuit protection.
- Welded steel base frame.
- Sparkling white IMRON® polyurethane paint.
- Operator's and parts manuals.
- Optional sound enclosure for industry best sound and vibration attenuation in a compact design.

AC Output※	M50T13L
60 Hz, 1800 RPM[1] kW	**50 kW**
Voltage regulation	0.5%
Volts/amps	240V/208A
Frequency droop control	Isochronous 0%
Phase and power factor	Three phase 0.8 power factor std.
	Opt.: Single phase -1.0 power factor
Generator full load temperature rise	90°C temperature rise at 50°C ambient
Lugger Diesel Engine Data	
Inline cylinders/aspiration/operating cycle	I-4 / Turbocharged/ 4
Displacement - cid (liter)	276 (4.5)
Bore/stroke - inches (mm)	4.19/5 (106/127)
Fuel injection pump type and control	Electronic (HPCR)
Cooling System (Heat exchanger standard, keel cooling optional)	
Heat rejection to jacket water - 1800 rpm BTU min	4,548
Freshwater pump capacity - 1800 rpm/gpm (lpm)	30.9 (117)
KC approximate cooling capacity - gal (ltr)	4.5 (17)
HE approximate cooling capacity - gal (ltr)	3.7 (14)
Seawater pump capacity - 1800 rpm/gpm(lpm)	24 (91)
Max seawater pump suction head lift - ft (m)	10 (3)
Sea water pump inlet hose ID - in (mm)	1.25 (32)
Min. seawater inlet/discharge thru-hull - in (mm)	1.25 (32)
DC Electrical (12V standard, 24V optional)	
DC starting voltage - standard (optional)	12 (24)
Min battery capacity - amp hr/12V CCA (24V CCA)	200/1100 (750)
Starter rolling amps @ 0°C - 12VDC (24VDC)	920 (600)
12 Volt battery cable size up to 10 ft (3m)	2/0
Air	
Air consumption - 1800 rpm/cfm (m^3/m)	215 (6.1)
Approx heat radiated to air - 1800 rpm/BTU/min	596
Generator cooling air flow 1&3Ø - 1800 rpm cfm	700
Exhaust gas volume - 1800 rpm/cfm (m^3/m)	521 (14.7)
Exhaust gas temp - 1800 rpm/F° (C°)	846 (452)
Max. exhaust back pressure - inch H^2O (mm H^2O)	30 (762)
Wet exhaust elbow OD- in (mm)	4 (102)
Dry exhaust elbow in (mm)	4 (102)
Fuel	
Fuel injection pump type and control	High Pressure Common Rail
Min suction - in (mm)	3/8 (10)
Min return line - in (mm)	3/8 (10)
Max fuel transfer pump suction lift - ft (m)	7.9 (2.4)
Max fuel flow to transfer pump at 1800 rpm - gph	19.5
Specific fuel consumption max load 1800 rpm - lbs.hp.hr	0.394
Approx. fuel rate ✓ at 1800 RPM full load - gph (lph)	4.3 (16.3)
Fuel supply and return- max pressure PSI. Height - ft (m)	2.9
Fuel supply and return. Height - ft (m)	7.9 (2.4)
Max Engine Operating Angle	
Continuous (with separate expansion tank)	30°
Intermittent (2 minutes)	45°
Dimensions and Weight - Low Profile Do not use for installation. Contact factory for installation drawings and info.	
Length - inches (mm)	75.0 (1905)
Width - inches (mm)	38.0 (965)
Height - inches (mm)	38.2 (970)
Weight - pounds (kilograms)	2315 (1050)
Dimensions and Weight - w/optional enclosure Do not use for installation. Contact factory for installation drawings and info.	
Length - inches (mm)	75.0 (1905)
Width - inches (mm)	38.0 (965)
Height - inches (mm)	40.9 (1039)
Weight - pounds (kilograms)	2849 (1292)

※ Prime kW ratings for 3Ø at 0.8 power factor. Consult factory for deration factors.
✓ Based on prime kW rating at 1800 and 1500 RPM. Fuel rate may vary depending on operating conditions.

Northern Lights, Inc. is ISO 9001 certified through Lloyds Register Quality Assurance

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

NORTHERN LIGHTS

MECTRA SYNERGY

M65T13L

FEATURES AND BENEFITS

ENGINE BLOCK
- US EPA Tier III compliant.
- Four cylinder, four cycle, in-line, liquid cooled, overhead valve, marine diesels based on heavy-duty industrial engine blocks.
- Balanced, forged crankshaft with induction hardened journals and rolled fillets for long life.
- Replaceable, wet cylinder liners for long life and low rebuild costs.
- Bimetallic valves with chrome stems and rotators.
- Replaceable valve seats and guides.
- Three ring aluminum alloy pistons with Ni-Resist insert for the top ring. Keystone piston ring reduces carbon buildup under light loads.
- A single poly-vee drive belt powers the alternator and jacket-water pump.

FUEL SYSTEM
- High pressure common rail fuel injection for smooth, clean delivery.
- Direct fuel injection system.
- Ring clamp fuel filters with air bleed and drain.
- Diaphragm-type, mechanical fuel transfer pump with manual priming lever.

LUBRICATION SYSTEM
- Positive displacement gear-type oil pump.
- Full flow, spin-on oil filter.
- Oil spray cooling reduces piston crown temperature.
- Jacket-water, plate-type, full flow oil cooler reduces heat and prevents lube oil breakdown.
- Large capacity oil pan.
- A closed loop crankcase vent traps oil vapor to keep the engine room clean.

AIR SYSTEM
- Dry air filter silences intake noise.
- Turbocharger with jacket water cooled turbine housing for safety.

COOLING SYSTEM
- Keel cooled with heat exchanger option.
- Gear driven sea water pump with self-priming flexible impeller. Bronze with stainless steel shaft.
- Cast iron expansion tank.
- Two thermostats for quick warm-ups and safety.
- Cast-iron exhaust manifold for reliable temperature control.

ESP AND DC ELECTRICAL SYSTEM
- Negative ground, 12 volt DC system has circuit breaker, starter motor and alternator with regulator.
- Low oil pressure and high coolant temperature safety shutdowns.
- Optional control panels help you specify the amount and type of information required. Comprehensive list of optional alarms and safety shutdowns.
- Optional DC logic system for simplified maintenance.
- Optional pre-wired engine, panel with terminal strips.

AC GENERATOR
- Direct coupled, single bearing, 12 lead, reconnectable AC generator. Maintenance free brushless design.
- All NL generators meet or exceed class society standards with Class "H" insulation, accessible diodes, oversized ball bearings, marine grade shafts and conservative 90°/50° heat rise ratings.
- Engines and generators are torsionally matched for long life.
- Automatic voltage regulator; ±0.5% regulation over the entire range from no load to full load.
- Configured for 0% isochronous droop with integral electronic governor control supplied by ECU.

SPECIAL EQUIPMENT
- PMG option for 300% short circuit protection.
- Welded steel base frame.
- Sparkling white IMRON® polyurethane paint.
- Operator's and parts manuals.
- Optional sound enclosure for industry best sound and vibration attenuation in a compact design.

AC Output✕	M65T13L
60 Hz, 1800 RPM¹ kW	**65 kW**
Voltage regulation	0.5%
Frequency droop control	Isochronous 0%
Phase and power factor	Three phase 0.8 power factor std.
	Opt.: Single phase -1.0 power factor
Generator full load temperature rise	90°C temperature rise at 50°C ambient
Lugger Diesel Engine Data	
Inline cylinders/aspiration/operating cycle	I-4 / Turbocharged/ 4
Displacement - cid (liter)	276 (4.5)
Bore/stroke - inches (mm)	4.19/5 (106/127)
Fuel injection pump type and control	Electronic (HPCR)
Cooling System (Keel cooling standard, heat exchanger optional)	
Heat rejection to jacket water -1800 rpm BTU min	4,548
Freshwater pump capacity - 1800 rpm/gpm (lpm)	30.9 (117)
KC approximate cooling capacity - gal (ltr)	4.5 (17)
HE approximate cooling capacity - gal (ltr)	3.7 (14)
Seawater pump capacity - 1800 rpm/gpm(lpm)	24 (91)
Max seawater pump suction head lift - ft (m)	10 (3)
Sea water pump inlet hose ID - in (mm)	1.25 (32)
Min. seawater inlet/discharge thru-hull - in (mm)	1.25 (32)
DC Electrical (12V standard, 24V optional)	
DC starting voltage - standard (optional)	12 (24)
Min battery capacity - amp hr/12V CCA (24V CCA)	200/1100 (750)
Starter rolling amps @ 0°C - 12VDC (24VDC)	920 (600)
12 Volt battery cable size up to 10 ft (3m)	2/0
Air	
Air consumption - 1800 rpm/cfm (m^3/m)	215 (6.1)
Approx heat radiated to air - 1800 rpm/BTU/min	596
Generator cooling air flow 1&3Ø - 1800 rpm cfm	700
Exhaust gas volume - 1800 rpm/cfm (m^3/m)	521 (14.7)
Exhaust gas temp - 1800 rpm/F° (C°)	846 (452)
Max. exhaust back pressure - inch H^2O (mm H^2O)	30 (762)
Wet exhaust elbow OD- in (mm)	4 (102)
Dry exhaust elbow in (mm)	4 (102)
Fuel	
Fuel injection pump type and control	High Pressure Common Rail
Min suction - in (mm)	3/8 (10)
Min return line - in (mm)	3/8 (10)
Max fuel transfer pump suction lift - ft (m)	7.9 (2.4)
Max fuel flow to transfer pump at 1800 rpm - gph	19.5
Specific fuel consumption max load 1800 rpm - lbs.hp.hr	0.394
Approx. fuel rate ✓ at 1800 RPM full load - gph (lph)	5.5 (20.8)
Fuel supply and return- max pressure PSI. Height - ft (m)	2.9
Fuel supply and return. Height - ft (m)	7.9 (2.4)
Max Engine Operating Angle	
Continuous (with separate expansion tank)	30°
Intermittent (2 minutes)	45°
Dimensions and Weight - Low Profile Do not use for installation. Contact factory for installation drawings and info.	
Length - inches (mm)	75.0 (1905)
Width - inches (mm)	38.0 (965)
Height - inches (mm)	37.8 (960)
Weight - pounds (kilograms)	2594 (1177)
Dimensions and Weight - w/optional enclosure Do not use for installation. Contact factory for installation drawings and info.	
Length - inches (mm)	75.0 (1905)
Width - inches (mm)	38.0 (965)
Height - inches (mm)	40.9 (1039)
Weight - pounds (kilograms)	3086 (1401)

✕ Prime kW ratings for 3Ø at 0.8 power factor. Consult factory for deration factors
✓ Based on prime kW rating at 1800 and 1500 RPM. Fuel rate may vary depending on operating conditions.

Northern Lights, Inc. is ISO 9001 certified through Lloyds Register Quality Assurance

ISO 9001

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

NORTHERN LIGHTS

MECTRA SYNERGY

M80A13L

FEATURES AND BENEFITS

ENGINE BLOCK
- US EPA Tier III compliant.
- Four cylinder, four cycle, in-line, liquid cooled, overhead valve, marine diesels based on heavy-duty industrial engine blocks.
- Balanced, forged crankshaft with induction hardened journals and rolled fillets for long life.
- Replaceable, wet cylinder liners for long life and low rebuild costs.
- Bimetallic valves with chrome stems and rotators.
- Replaceable valve seats and guides.
- Three ring aluminum alloy pistons with Ni-Resist insert for the top ring. Keystone piston ring reduces carbon buildup under light loads.
- A single poly-vee drive belt powers the alternator and jacket-water pump.

FUEL SYSTEM
- High pressure common rail fuel injection for smooth, clean delivery.
- Direct fuel injection system.
- Ring clamp fuel filters with air bleed and drain.
- Electric fuel pump integrated into primary fuel filter. Computer controlled priming for ease of operation.

LUBRICATION SYSTEM
- Positive displacement gear-type oil pump.
- Full flow, spin-on oil filter.
- Oil spray cooling reduces piston crown temperature.
- Jacket-water, plate-type, full flow oil cooler.
- Large capacity oil pan.
- Closed loop crankcase vent.

AIR SYSTEM
- Dry air filter silences intake noise.
- Turbocharger with jacket water cooled turbine housing.

COOLING SYSTEM
- Heat exchanger with keel cooled option.
- Gear driven sea water pump with self-priming flexible impeller. Bronze with stainless steel shaft.
- Cast iron expansion tank.
- Two thermostats for quick warm-ups and safety.
- Cast-iron exhaust manifold for reliable temperature control.

ESP AND DC ELECTRICAL SYSTEM
- Negative ground, 12 volt DC system has circuit breaker, starter motor and alternator with regulator.
- Low oil pressure and high coolant temperature safety shutdowns.
- Optional control panels help you specify the amount and type of information required. Comprehensive list of optional alarms and safety shutdowns.
- Optional DC logic system for simplified maintenance.
- Optional pre-wired engine, panel with terminal strips.

AC GENERATOR
- Direct coupled, single bearing, 12 lead, reconnectable AC generator. Maintenance free brushless design.
- All NL generators meet or exceed class society standards with Class "H" insulation, accessible diodes, oversized ball bearings, marine grade shafts and conservative 90°/50° heat rise ratings.
- Engines and generators are torsionally matched for long life.
- Automatic voltage regulator; ±0.5% regulation over the entire range from no load to full load.
- Configured for 0% isochronous droop with integral electronic governor control supplied by ECU.

SPECIAL EQUIPMENT
- PMG option for 300% short circuit protection.
- Welded steel base frame.
- Sparkling white IMRON® polyurethane paint.
- Operator's and parts manuals.
- Optional sound enclosure for industry best sound and vibration attenuation in a compact design.

AC Output※	**M80A13L**
60 Hz, 1800 RPM* kW	**80 kW**
Voltage regulation	1%
Frequency droop control	Isochronous 0%
Phase and power factor	Three phase -0.8 power factor std.
Generator full load temperature rise	90°C temperature rise at 50°C ambient
Lugger Diesel Engine Data	
Inline cylinders/aspiration/operating cycle**	I-4 / Turbo & Aftercooled / 4
Displacement - cid (liter)	276 (4.5)
Bore/stroke - inches (mm)	4.19/5 (106/127)
Fuel injection pump type and control	Electronic (HPCR)
Cooling System (Heat exchanger standard)	
Heat rejection to jacket water - BTU min	5,863
Freshwater pump capacity - gpm (lpm)***	40.9 (155)
Approximate keel coolant capacity - gal (ltr)	5.2 (20)
Heat exchanger connection size in/out - inch	2.0
Heat exchanger approx. coolant capacity - gal (ltr)	4.4 (17)
Seawater pump capacity - gpm(lpm)	52 (197)
Max seawater pump suction head lift - ft (m)	10 (3)
Sea water pump inlet hose ID - in (mm)	2.0 (51)
Min. seawater inlet/discharge thru-hull - in (mm)	2.0 (51)
DC Electrical (12V standard, 24V optional)	
DC starting voltage - standard (optional)	12 (24)
Min battery capacity - amp hr/12V CCA (24V CCA)	200/1100 (750)
Starter rolling amps @ 0°C - 12VDC (24VDC)	920 (600)
12 Volt battery cable size up to 10 ft (3m)	2/0
Air	
Air consumption - cfm (m^3/m)	301 (8.5)
Approx heat radiated to air - BTU/min	689
Generator cooling air flow 1&3Ø - cfm	700
Exhaust gas volume - cfm (m^3/m)	685 (19.4)
Exhaust gas temp - F° (C°)	813 (434)
Max. exhaust back Pressure - inch H^2O (mm H^2O)	30 (762)
Wet exhaust elbow OD- in (mm)	4.5 (114)
Dry exhaust elbow in (mm)	4 (102)
Fuel	
Fuel injection pump type and control	HPCR
Min suction line I.D. - in (mm)	3/8 (10)
Min return line I.D. - in (mm)	1/4 (6)
Max fuel transfer pump suction lift - in (mm)	80 (2032)
Max fuel flow to transfer pump - gph	40.0
Specific fuel consumption max load (110%) - lbs.hp.hr	0.375
Approx. fuel rate✓ at full load (100%) - gph (lph)	6.1 (23)
Max Engine Operating Angle	
Continuous (with separate expansion tank)	30°
Intermittent (2 minutes)	45°
Dimensions and Weight (Do not use for installation. Contact factory for installation drawings and info)	
Length - inches (mm)	75.0 (1905)
Width - inches (mm)	38.0 (965)
Height - inches (mm)	39.4 (1001)
Weight - pounds (kilograms)	3107 (1409)
Dimensions and Weight w/Optional Sound Enclosure (Contact factory for installation drawings and info)	
Length - inches (mm)	75.0 (1905)
Width - inches (mm)	38.0 (965)
Height - inches (mm)	40.9 (1039)
Weight - pounds (kilograms)	3599 (1632)

※ Prime kW ratings for 3Ø at 0.8 power factor. Consult factory for deration factors.
✓ Based on prime kW rating at 1800 and 1500 RPM. Fuel rate may vary depending on operating conditions.

Northern Lights, Inc. is ISO 9001 certified through Lloyds Register Quality Assurance

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

NORTHERN LIGHTS

MECTRA SYNERGY

M99A13L

FEATURES AND BENEFITS

ENGINE BLOCK
- US EPA Tier III compliant.
- Four cylinder, four cycle, in-line, liquid cooled, overhead valve, marine diesels based on heavy-duty industrial engine blocks.
- Balanced, forged crankshaft with induction hardened journals and rolled fillets for long life.
- Replaceable, wet cylinder liners for long life and low rebuild costs.
- Bimetallic valves with chrome stems and rotators.
- Replaceable valve seats and guides.
- Three ring aluminum alloy pistons with Ni-Resist insert for the top ring. Keystone piston ring reduces carbon buildup under light loads.
- A single poly-vee drive belt powers the alternator and jacket-water pump.

FUEL SYSTEM
- High pressure common rail fuel injection for smooth, clean delivery.
- Direct fuel injection system.
- Ring clamp fuel filters with air bleed and drain.
- Electric fuel pump integrated into primary fuel filter. Computer controlled priming for ease of operation.

LUBRICATION SYSTEM
- Positive displacement gear-type oil pump.
- Full flow, spin-on oil filter.
- Oil spray cooling reduces piston crown temperature.
- Jacket-water, plate-type, full flow oil cooler.
- Large capacity oil pan.
- Closed loop crankcase vent.

AIR SYSTEM
- Dry air filter silences intake noise.
- Turbocharger with jacket water cooled turbine housing.

COOLING SYSTEM
- Heat exchanger with keel cooled option.
- Gear driven sea water pump with self-priming flexible impeller. Bronze with stainless steel shaft.
- Cast iron expansion tank.
- Two thermostats for quick warm-ups and safety.
- Cast-iron exhaust manifold for reliable temperature control.

ESP AND DC ELECTRICAL SYSTEM
- Negative ground, 12 volt DC system has circuit breaker, starter motor and alternator with regulator.
- Low oil pressure and high coolant temperature safety shutdowns.
- Optional control panels help you specify the amount and type of information required. Comprehensive list of optional alarms and safety shutdowns.
- Optional DC logic system for simplified maintenance.
- Optional pre-wired engine, panel with terminal strips.

AC GENERATOR
- Direct coupled, single bearing, 12 lead, reconnectable AC generator. Maintenance free brushless design.
- All NL generators meet or exceed class society standards with Class "H" insulation, accessible diodes, oversized ball bearings, marine grade shafts and conservative 90°/50° heat rise ratings.
- Engines and generators are torsionally matched for long life.
- Automatic voltage regulator; ±0.5% regulation over the entire range from no load to full load.
- Configured for 0% isochronous droop with integral electronic governor control supplied by ECU.

SPECIAL EQUIPMENT
- PMG option for 300% short circuit protection.
- Welded steel base frame.
- Sparkling white IMRON® polyurethane paint.
- Operator's and parts manuals.
- Optional sound enclosure for industry best sound and vibration attenuation in a compact design.

AC Output※	**M99A13L**
60 Hz, 1800 RPM* kW	**99 kW**
Voltage regulation	1%
Frequency droop control	Isochronous 0%
Phase and power factor	Three phase -0.8 power factor std.
Generator full load temperature rise	90°C temperature rise at 50°C ambient
Lugger Diesel Engine Data	
Inline cylinders/aspiration/operating cycle**	I-4 / Turbo & Aftercooled / 4
Displacement - cid (liter)	276 (4.5)
Bore/stroke - inches (mm)	4.19/5 (106/127)
Fuel injection pump type and control	Electronic (HPCR)
Cooling System (Heat exchanger standard)	
Heat rejection to jacket water - BTU min	7,001
Freshwater pump capacity - gpm (lpm)***	40.9 (155)
Approximate keel coolant capacity - gal (ltr)	5.2 (20)
Heat exchanger connection size in/out - inch	2.0
Heat exchanger approx. coolant capacity - gal (ltr)	4.4 (17)
Seawater pump capacity - gpm(lpm)	52 (197)
Max seawater pump suction head lift - ft (m)	10 (3)
Sea water pump inlet hose ID - in (mm)	2.0 (51)
Min. seawater inlet/discharge thru-hull - in (mm)	2.0 (51)
DC Electrical (12V standard, 24V optional)	
DC starting voltage - standard (optional)	12 (24)
Min battery capacity - amp hr/12V CCA (24V CCA)	200/1100 (750)
Starter rolling amps @ 0°C - 12VDC (24VDC)	920 (600)
12 Volt battery cable size up to 10 ft (3m)	2/0
Air	
Air consumption - cfm (m^3/m)	301 (8.5)
Approx heat radiated to air - BTU/min	826
Generator cooling air flow 1&3Ø - cfm	700
Exhaust gas volume - cfm (m^3/m)	685 (19.4)
Exhaust gas temp - F° (C°)	813 (434)
Max. exhaust back Pressure - inch H^2O (mm H^2O)	30 (762)
Wet exhaust elbow OD- in (mm)	4.5 (114)
Dry exhaust elbow in (mm)	4 (102)
Fuel	
Fuel injection pump type and control	HPCR
Min suction line I.D. - in (mm)	3/8 (10)
Min return line I.D. - in (mm)	1/4 (6)
Max fuel transfer pump suction lift - in (mm)	80 (2032)
Max fuel flow to transfer pump - gph	40.0
Specific fuel consumption max load (110%) - lbs.hp.hr	0.366
Approx. fuel rate✓ at full load (100%) - gph (lph)	7.3 (27.8)
Max Engine Operating Angle	
Continuous (with separate expansion tank)	30°
Intermittent (2 minutes)	45°
Dimensions and Weight (Do not use for installation. Contact factory for installation drawings and info)	
Length - inches (mm)	75.0 (1905)
Width - inches (mm)	38.0 (965)
Height - inches (mm)	39.4 (1001)
Weight - pounds (kilograms)	3107 (1409)
Dimensions and Weight w/Optional Sound Enclosure (Contact factory for installation drawings and info)	
Length - inches (mm)	75.0 (1905)
Width - inches (mm)	38.0 (965)
Height - inches (mm)	40.9 (1039)
Weight - pounds (kilograms)	3599 (1632)

※ Prime kW ratings for 3Ø at 0.8 power factor. Consult factory for deration factors.
✓ Based on prime kW rating at 1800 and 1500 RPM. Fuel rate may vary depending on operating conditions.

Northern Lights, Inc. is ISO 9001 certified through Lloyds Register Quality Assurance

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

NORTHERN LIGHTS

MECTRA SYNERGY

M116A13L

FEATURES AND BENEFITS

ENGINE BLOCK
- Six cylinder, four cycle, in-line, liquid cooled, overhead valve, marine diesels based on heavy-duty industrial engine blocks.
- Balanced, forged crankshaft with induction hardened journals and rolled fillets for long life.
- Replaceable, wet cylinder liners for long life and low rebuild costs.
- Bimetallic valves with chrome stems and rotators.
- Replaceable valve seats and guides.
- Three ring aluminum alloy pistons with Ni-Resist insert for the top ring. Keystone piston ring reduces carbon buildup under light loads.
- Torsional crankshaft dampers help ensure smooth operation.
- A single poly-vee drive belt powers the alternator and jacket-water pump.

FUEL SYSTEM
- High pressure common rail fuel injection for smooth, clean delivery.
- Direct fuel injection systems
- Ring clamp fuel filters with air bleed and drain.
- Electric fuel pump integrated into primary fuel filter. Computer controlled priming for ease of operation.

LUBRICATION SYSTEM
- Positive displacement gear-type oil pump.
- Full flow, spin-on oil filter.
- Jacket-water, plate-type, full flow oil cooler reduces heat and prevents lube oil breakdown.
- Large capacity oil pan.
- A closed loop crankcase vent traps oil vapor to keep the engine room clean.

AIR SYSTEM
- Dry air filter silences intake noise.
- Turbocharger with jacket water cooled turbine housings for safety.
- Jacket water aftercooler provides optimized combustion and output.

COOLING SYSTEM
- Heat exchanger cooled.
- Gear driven sea water pump with flexible impeller made of bronze and stainless steel.
- Cast iron expansion tank with brass filler neck.
- Two thermostats for quick warm-ups and safety.
- Cast-iron exhaust manifold for reliable temperature control.

ESP AND DC ELECTRICAL SYSTEM
- Negative ground, 12 volt DC system has circuit breaker, starter motor and alternator with regulator. Relay board and senders for gauged panels standard.
- Standard S-3B remote control panel with engine hour meter, coolant temperature gauge, oil pressure gauge, DC voltage meter, start-stop and shutdown bypass switches. Additional optional panels help you specify the amount and type of information delivered.
- Low oil pressure and high coolant temperature safety shutdown system.

AC GENERATOR
- Direct coupled, single bearing, 12 lead, reconnectable AC generator. Maintenance free brushless design.
- All NL generators meet or exceed class society standards with Class "H" insulation, accessible diodes, oversized ball bearings, marine grade shafts and conservative 90°/50° heat rise ratings.
- Engines and generators are torsionally matched for long life.
- Automatic voltage regulator; ±0.5% regulation over the entire range from no load to full load.
- Configured for isochronous operation with integral electronic governor control supplied by ECU. Frequency droop available upon request.

SPECIAL EQUIPMENT
- IMO Tier 3 exempt
- US EPA Tier III compliant (60 Hz)
- IMO Tier 2 compliant (50 Hz)
- Welded steel base frame
- Belt guard
- Hydrolastic vibration isolation mounts
- Sparkling white IMRON® polyurethane paint
- Operator's and parts manuals

AC Output *		
60 Hz, 1800 RPM	**116 kW**	
50 Hz, 1500 RPM	**116 kW**	
Voltage regulation	+/- 0.5%	
Frequency droop control	Isochronous, 0.5 Hz, 1.7 Hz, 3.0 Hz	
Phase and power factor	Three phase 0.8 power factor std.	
Generator full load temperature rise	90°C temperature rise at 50°C ambient	
Lugger Diesel Engine Data		
Inline cylinders/aspiration/operating cycle	I-6 / Turbo & Aftercooled / 4	
Displacement - cid (liter)	414 (6.8)	
Bore/stroke - inches (mm)	4.19/5 (106/127)	
Fuel injection pump type and control	Electronic (HPCR)	
Cooling System (Heat exchanger cooled)	**60 Hz**	**50 Hz**
Heat rejection to jacket water - BTU min	9,580	7,980
Freshwater pump capacity - gpm (lpm)	52.0 (197)	42.9 (162)
Approximate coolant capacity - gal (ltr)	9.0 (34)	9.0 (34)
Seawater Pump Flow - gpm(lpm)	51 (192)	43 (162)
Max seawater pump suction head lift - ft (m)	9.8 (3)	9.8 (3)
Sea water pump inlet hose ID - in (mm)	2.0 (51)	2.0 (51)
Min. seawater inlet/discharge thru-hull - in (mm)	2.0 (51)	2.0 (51)
DC Electrical (12V standard, 24V optional)		
DC starting voltage - standard (optional)	12 (24)	
Min battery capacity - 12V CCA (24V CCA)	925 (625)	
Starter rolling amps @ 0°C - 12VDC (24VDC)	920 (600)	
12 Volt battery cable size up to 10 ft (3m)	000	
Air	**60 Hz**	**50 Hz**
Air consumption - cfm (m^3/m)	510 (14.4)	325 (9.2)
Approx heat radiated to air - BTU/min (kW)	1,085 (19)	966 (17)
Generator cooling air flow 1 & 3 Ø - cfm (m^3/m)	1,100(31)	915 (26)
Exhaust gas volume - cfm (m^3/m)	1,036 (29.3)	747 (21.2)
Exhaust gas temp - F° (C°)	694 (368)	822 (439)
Max. exhaust back pressure - inch H^2O (mm H^2O)	30 (762)	30 (762)
Wet exhaust elbow OD- in (mm)	5 (127)	5 (127)
Dry exhaust elbow in (mm)	4 (102)	4 (102)
Fuel		
Fuel injection pump type and control	High Pressure Common Rail	
Min suction line size - in (mm)	0.31 (8)	
Min return line size - in (mm)	0.31 (8)	
Max fuel transfer pump suction lift - ft (m)	7.9 (2.4)	
Max fuel flow to transfer pump - gph	42.8	
Specific fuel consumption full load 60 hz - lbs/hp-hr	0.411	
Specific fuel consumption full load 50 hz - lbs/hp-hr	0.365	
Approx. fuel rate** at 60 Hz full load - gph (lph)	10.0 (38.0)	
Approx. fuel rate** at 50 Hz full load - gph (lph)	8.9 (33.8)	
Max Engine Operating Angle		
Continuous (with separate expansion tank)	25	
Intermittent (2 minutes)	35	
Dimensions and Weight^	**Open Genset**	**w/ Enclosure**
Length - inches (mm)	84.4 (2144)	90.0 (2286)
Width - inches (mm)	38.3 (973)	42.0 (1067)
Height - inches (mm)	39.84 (1012)	42.0 (1067)
Weight - pounds (kilograms)	3405 (1544)	4122 (1869)

*. Prime kW ratings for 3 Ø at 0.8 power factor. Consult factory for deration factors.
**. Based on prime kW rating at 1800 and 1500 RPM. Fuel rate may vary depending on operating conditions.

^ Dimensions provided for information only. Do not use for installation. Contact factory for installation drawings and info.

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

NORTHERN LIGHTS

MECTRA SYNERGY

EPA Tier II M1066 SERIES

99-160 kW, 60 Hz @ 1800 RPM
80-115 kW, 50 Hz @ 1500 RPM

FEATURES AND BENEFITS

AFTERCOOLED FOR HIGH POWER DENSITY

Northern Lights pioneered the marinization of this engine, and still leads the way in Engineering quality. Case in point: the exclusive M1066 aftercooler. Because cooler air is more oxygenated than warm, it makes for better combustion. This aftercooler, along with electronically controlled fuel injection, give you more kW output.

ELECTRONIC SYSTEM PROFILER

"ESP" is a window to your set's real time operating condition. The ECU that controls the electronic fuel injection produces a SAE J1939 data stream of engine information that can be shown on an optional CAN Bus monitor panel.

SUPERIOR PMG GENERATOR ENDS

Northern Lights generator ends achieve ±0.5% voltage regulation. All have low temperature rise ratings that meet or exceed classification society requirements including ABS and Lloyds. All M1066 generator sets have Permanent Magnet Generators for 300% short circuit capability required for classed vessels.

COMMITTED TO PROVIDING COMPLETE SOLUTIONS

Northern Lights products are thoroughly factory tested and go through a complete quality control program to ensure your total satisfaction Our design philosophy allows us to provide comprehensive solutions to your power production needs. Because engine room space is always at a premium, Northern Lights offers Low-Profile generator sets that save valuable inches where you need it most. Our line of options and accessories are designed to integrate into a total power system specifically built for your vessel. PTO's, sound enclosures and custom panels are among the options that make your power system as unique as your boat.

COMPONENT SPECIFIC FEATURES

ENGINE BLOCK

- Lugger six cylinder, four cycle, in-line, liquid cooled, overhead valve, marine diesel based on heavy-duty industrial engine block.
- Balanced, forged, hardened crankshaft with induction hardened journals and rolled fillets.
- Bimetallic valves have chrome stems & rotators.
- Replaceable valve seats and guides.
- Three ring aluminum alloy pistons with Ni-Resist insert for the top ring. Keystone piston ring reduces carbon buildup under light loads.
- Torsional crankshaft vibration damper for smooth operation.
- 8 groove, poly-vee drive belt powers the DC alternator & freshwater coolant system pump.
- Replaceable, wet cylinder liners for long life and low rebuild costs.

FUEL SYSTEM

- Direct fuel injection systems (see feature box below)
- Ring clamp fuel filter with air bleed and drain.
- Diaphragm-type, mechanically driven fuel transfer pump with manual priming lever. Electric fuel transfer pump on M1066A2 and A3.
- Flexible fuel lines routed to fuel manifold on base frame for easy installation of vessel's hard piping.

LUBRICATION SYSTEM

- 500 hour oil change interval when fuel and oil requirements are met.
- Positive displacement gear-type oil pump.
- Full flow, spin-on oil filter.
- Oil spray cooling reduces piston crown temperature for longer life.
- Freshwater, plate-type, full flow oil cooler reduces heat and thermal breakdown of lube oil.
- Large capacity oil pan.
- Cast aluminum rocker arm cover traps valve noise and acts as a closed loop crank-case vent to keep oil vapor in the engine.
- Lube oil drain for quick oil changes.

FRESHWATER COOLING SYSTEM

- 2 thermostats for safety and quicker warm-ups.
- Heat exchanger cooling includes:
- Gear driven, flexible impeller seawater pump. Easy to clean, tube-type heat exchanger is made of cupro-nickel for long life.
- Cast iron, expansion tank with brass filler neck for easy filling.
- Cast-iron exhaust manifold has double pass freshwater flow for even temperature control, fast warm-up and no hot spots.
- Zinc anode electrolysis protection.

SPECIAL EQUIPMENT

- Hydrolastic mounts isolate 98% of set vibration from hull.
- Welded steel base frame with drip pan. Easy to clean.
- Beltguard protects operator.
- Sparkling white, IMRON® poly-urethane paint protects your set.
- Operator's and parts manuals.
- Optional low profile sound enclosure for industry best attenuation in smaller package.

AIR SYSTEM-TURBOCHARGER-AFTERCOOLER

- Dry air filter cleans air and reduces air intake noise.
- M1066A1, A2 and A3 models have aftercooler with aircraft quality, 70/30 cupro-nickel, two pass element. Oval water tubes are easy to clean and stronger than round tubes. Corrugated air cooling fin design supports tubes better than plate fin type. Seawater piping is cast bronze and stainless steel. Water never touches the cast aluminum air ducts. No gaskets; all components are machined and have o-ring seals. Seawater direct from the pump for maximum cooling. Dry bolt holes protect cylinders. Turbocharged to increase output. The turbocharger turbine housings are freshwater cooled for safety.
- US EPA Tier II certified for use in non-US flagged vessels.

DC ELECTRICAL SYSTEM AND ELECTRONIC SYSTEM PROFILER

- Standard, S-3B remote mount control panel with NEMA enclosure has engine hour meter, coolant temperature gauge, oil pressure gauge, DC voltage meter, start-stop switch and shutdown bypass switch.
- Low oil pressure and high coolant temperature safety shutdowns.
- Northern Lights ESP supplies SAE J1939 data stream through a CAN bus plug for optional engine monitor.
- Negative ground, 12 volt DC system has circuit breaker, starter motor and battery charging alternator with regulator.
- Reliable relay based DC system is easy to trouble shoot and repair. Each relay is inexpensive and simply plug-in. No expensive printed circuit board to fail. Relays make multi-panel installation up to 110 ft from set quick & easy. Engine and panel are pre-wired and have terminal strips.

AC GENERATOR

- Direct coupled, single bearing, 12 lead, re-connectable AC generator. Maintenance free brushless design.
- Generators meet or exceed ABS standards and include class H insulation, accessible diodes, oversized ball bearings and marine grade shafts. Conservative heat rise rating of 95°/50° on T, A Series and 60 Hz H units. (Heat rise rating of 110°/45° on 50 Hz H units.)
- Engines and generators are torsionally matched for long life.
- Isochronous electronic governor for 0% AC frequency droop.
- Automatic voltage regulator gives fast response to electrical load changes. Voltage is regulated to ±0.5% (one half of one percent) over the entire range from no load to full load.
- All M1066 models have PMG (permanent magnet generator) to power the automatic voltage regulator for 300% short circuit capability needed by classed vessels.

CLASSIFICATION STANDARDS

ABS Type approval on M1066A1 A2 and A3 models. Lloyd's Register states that Northern Lights marine generator sets have been successfully tested in accordance with relevant requirements of Lloyd's Register for Marine Generator applications.

ABS TYPE APPROVED PRODUCT

LLOYD'S REGISTER LR04 ISO 9001

Lloyd's Register

GENERAL SPECIFICATIONS AND DIMENSIONS

AC Output[1]	**M1066TL**	**M1066A**	**M1066A1**	**M1066A2**	**M1066A3**
60 Hz, 1800 RPM[1] kW	99 kW	n/a	130 kW	145 kW	160 kW
50 Hz, 1500 RPM[1] kW	80 kW	99 kW	105 kW	115 kW	n/a
Voltage regulation and PMG	All models: ±0.5% (±1/2 of 1 percent) voltage regulation & permanent magnet generator AVR power supply.				
Frequency droop control	All models: Isochronous 0% frequency droop control				
Phase and power factor	All models: 3 phase-0.8 power factor is standard				
Generator full load temperature rise	All models (except where noted): 95°C temperature rise at 50°C ambient[2]				
Lugger Marine Diesel Engine Data					
Inline cylinders/Operating cycle	All models: Inline six / four cycle				
Aspiration	Turbocharged	Turbo Aftercooled	Turbo Aftercooled	Turbo Aftercooled	Turbo Aftercooled
Displacement - cid (liter)	All models: 414 (6.8)				
Bore/Stroke - inches (mm)	All models: 4.19/5 (106/127)				
HP @ 1800 RPM (1500 RPM)[3]	150 (114)	n/a (149)	200 (160)	228 (172)	256 (n/a)
Max. front power take off HP - 60 Hz (50 Hz)	149 (114)	n/a (149)	190(158)	190 (158)	190 (n/a)
Oil capacity with filter - quarts (ltr)	20 (19)	34 (32.5)	34 (32.5)	34 (32.5)	34 (32.5)
Engine Cooling System					
Approx. heat exchanger cooling capacity - gal (ltr)	All models: 6.5 (24.7)				
Min. seawater inlet/discharge through hull dia. - in (mm)	1.25 (32)	2 (51)	2 (51)	2 (51)	2 (51)
Sea water pump inlet hose ID - in (mm)	1.25 (32)	2 (51)	2 (51)	2 (51)	2 (51)
Heat rejection to jacket water - BTU min 60Hz/50Hz	CF	n/a / 4553	CF	CF / 5110	CF (n/a)
Freshwater pump capacity - 60 Hz - gpm (lpm)	60 (227)	n/a	60 (227)	60 (227)	60 (227)
50 Hz - gpm (lpm)	50 (189)	50 (189)	50 (189)	50 (189)	N/A
Seawater pump capacity - 60 Hz - gpm (lpm)	24 (91)	n/a	42 (159)	42 (159)	42 (159)
50 Hz - gpm (lpm)	20 (76)	35 (133)	35 (133)	35 (133)	N/A
Max. seawater pump suction head - in (m)	All models: 39 (1)				
Consult factory for keel and skin cooler data					
DC Electrical System					
DC starting voltage - standard (optional)	All models: 12 (24)				
Min. battery capacity - amp hr/12V CCA (24V CCA)	All models: 225/800 (570)				
Starter rolling amps @0° 12VDC (24VDC) 920 (600)	All models: 920 (600)				
12Volt battery cable size up to 10 ft - 3m	All models: 000				
Air & Exhaust Systems					
Generator cooling air flow 1&3 phase - 60 Hz (50 Hz)/cfm	1100 (915)	n/a (915)	1100 (915)	1100 (CF)	1100 (N/A)
Air consumption - 60 Hz - cfm (m^3/m)	352 (9.2)	n/a	420 (11.9)	452 (12.8)	494 (14)
50 Hz - cfm (m^3/m)	240 (6.8)	297 (8.4)	318 (9.0)	348 (9.9)	N/A
Exhaust gas volume - 60 Hz - cfm (m^3/m)	851 (24.1)	n/a	1081 (30.6)	1162 (32.9)	1306 (37)
50 Hz - cfm (m^3/m)	600 (17)	756 (21.4)	995 (28.2)	1070 (30.3)	N/A
Exhaust gas temp - 60 Hz - F° (C°)	984° (529°)	n/a	966° (519°)	966° (520°)	991° (533)
50 Hz - F° (C°)	945° (507°)	935 (502)	1076° (580°)	1076° (580°)	N/A
Approx. heat radiated to air BTU/min -60 Hz (50 Hz)	812 (656)	n/a (969)	1060 (861)	1189 (984)	1312 (N/A)
Max. exhaust Back Pressure - inch H^2O (mm H^2O)	All models: 30 (762)				
Fuel System					
Fuel injection pump type and control	Rotary Electronic	Rotary Electronic	Electronic	Electronic	Electronic
Min. suction & return line - in (mm)	All models: 3/8 (9.5)				
Max. fuel transfer pump suction lift - in (mm)	All models: 36 (914)				
Max. fuel flow to transfer pump - gph 60 Hz (50 Hz)	23.5 (22.7)	n/a (23.7)	25.6 (24.7)	49.6 (47.9)	49.6 (N/A)
Full load fuel returned to tank - gph 60 Hz (50 Hz)	15.6 (16.4)	n/a (16.4)	14,5 (15.6)	38.2 (38.7)	36.9 (N/A)
Specific fuel consumption max load - 60 Hz - lbs.hp.hr.0.377	n/a	0.359	0.352	0.351	
50 Hz - lbs.hp.hr.	0.355	0.349	0.347	0.347	N/A
Approx. fuel rate at 60 Hz full load - gph (lph)[4] 7.92 (30)	n/a	11.12 (42)	11.33 (42.9)	12.66 (47.9)	
50 Hz full load - gph (lph)[4]	6.35 (24)	7.32 (27.7)	9.19 (34.8)	9.30 (35.2)	N/A
Maximum Engine Operating Angle					
Continuous, with separate expansion tank. All Models	Front Down: 0-5°, (0-10°). Rear Down: 0-12°. Left or Right Down: 0-5°, (0-23°)				
Intermittent - 2 minutes.	All Models Front or Rear Down: 0-30°. Left or Right Down: 0-30°				
Dimensions and Weight - Low Profile [5,6]					
Set length - inch (mm)	81.0 (2058)	90.0 (2286)	90.0 (2286)	90.0 (2286)	90 (2286)
Set width - inch (mm)	All models: 42 (1066)				
Set height - inch (mm)	All models: 41.5 (1054)				
Approx. wet weight HE 3 phase 60 Hz - lbs (kg)	2886 (1306)	3541 (1646)	3541 (1646)	3630 (1646)	3734 (1694)
50 Hz - lbs (kg)	2886 (1306)	3630 (1646)	3630 (1646)	3630 (1646)	3734 (1694)
Sound enclosure length - inch (mm)	TBA (TBA)	90.0 (2286)	90.0 (2286)	90.0 (2286)	90.0 (2286)
Sound enclosure width - inch (mm)	38.0 (965)	42.0 (1067)	42.0 (1067)	42.0 (1067)	42.0 (1067)
Sound enclosure height - inch (mm)	41.0 (1041)	42.0 (1067)	42.0 (1067)	42.0 (1067)	42.0 (1067)
Sound enclosure weight - lbs (kg)	TBA (TBA)	436 (198)	436 (198)	436 (198)	436 (198)

*** All Models: US EPA Tier II; Available for non-US flagged vessels only.**

NOTES:

CF = consult factory representative or www.northern-lights.com for current information.

1. Prime kW ratings for 3Ø at 0.8 power factor. Consult factory for deration factors.
2. Lloyd's Register classed M1066H @ 50 Hz = 110°C temperature rise at 45°C ambient
3. Net flywheel hp rating for fully equipped engine at rated speed under SAE J816b.
4. Based on prime kW rating at 1800 and 1500 RPM. Fuel rate may vary depending on operating conditions.
5. Date for units with hydrolastic mounts, heat exchanger cooling and 3 phase generator ends. Dimensions and weight are affected by optional equipment, AC output, phase, exhaust and cooling configuration.
6. Consult factory for data on enclosures for single phase sets or sets with InSep.

NORTHERN LIGHTS

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

NORTHERN LIGHTS®

MECTRA SYNERGY

M1066 SERIES

120-185 kW, 60 Hz @ 1800 RPM
155 kW, 50 Hz @ 1500 RPM

FEATURES AND BENEFITS

AFTERCOOLED FOR HIGH POWER DENSITY

Northern Lights pioneered the marinization of this engine, and still leads the way in Engineering quality. Case in point: the exclusive M1066 aftercooler. Because cooler air is more oxygenated than warm, it makes for better combustion. This aftercooler, along with electronically controlled fuel injection, give you more kW output.

ELECTRONIC SYSTEM PROFILER

"ESP" is a window to your set's real time operating condition. The ECU that controls the electronic fuel injection produces a SAE J1939 data stream of engine information that can be shown on an optional CAN Bus monitor panel.

SUPERIOR PMG GENERATOR ENDS

Northern Lights generator ends achieve ±0.5% voltage regulation. All have low temperature rise ratings that meet or exceed classification society requirements including ABS and Lloyds. All M1066 generator sets have Permanent Magnet Generators for 300% short circuit capability required for classed vessels.

COMMITTED TO PROVIDING COMPLETE SOLUTIONS

Northern Lights products are thoroughly factory tested and go through a complete quality control program to ensure your total satisfaction Our design philosophy allows us to provide comprehensive solutions to your power production needs. Because engine room space is always at a premium, we offer Low-Profile generator sets that save valuable inches where you need it most. Our line of options and accessories are designed to integrate into a total power system specifically built for your vessel. PTO's, sound enclosures and custom panels are among the options that make your power system as unique as your boat.

COMPONENT SPECIFIC FEATURES

ENGINE BLOCK

- Six cylinder, four cycle, in-line, liquid cooled, overhead valve, marine diesels based on heavy-duty industrial engine blocks
- Balanced, forged crankshaft with induction hardened journals and rolled fillets for long life
- Replaceable, wet cylinder liners for long life and low rebuild costs
- Bimetallic valves with chrome stems and rotators
- Replaceable valve seats and guides
- Three ring aluminum alloy pistons with Ni-Resist insert for the top ring. Keystone piston ring reduces carbon buildup under light loads
- Torsional crankshaft dampers help ensure smooth operation
- A single poly-vee drive belt powers the alternator and jacket-water pump

FUEL SYSTEM

- High pressure common rail fuel injection for smooth, clean delivery
- Direct fuel injection systems
- Ring clamp fuel filters with air bleed and drain
- Electric fuel pump integrated into primary fuel filter. Computer controlled priming for ease of operation

LUBRICATION SYSTEM

- Positive displacement gear-type oil pump
- Full flow, spin-on oil filter
- Jacket-water, plate-type, full flow oil cooler reduces heat and prevents lube oil breakdown
- Large capacity oil pan
- A closed loop crankcase vent traps oil vapor to keep the engine room clean

AIR SYSTEM

- Dry air filter silences intake noise
- Turbocharger with jacket water cooled turbine housings for safety
- Seawater aftercooler provides optimized combustion and output

COOLING SYSTEM

- Heat exchanger cooling system
- Gear driven, belt-less sea water pump with flexible impeller
- Cast iron expansion tank with brass filler neck
- Two thermostats for quick warm-ups and safety
- Cast-iron exhaust manifold for reliable temperature control

ESP AND DC ELECTRICAL SYSTEM

- Negative ground, 12 volt DC system has circuit breaker, starter motor and alternator with regulator
- Low oil pressure and high coolant temperature safety shutdown system.
- Optional control panels help you specify the amount and type of information required Comprehensive list of optional alarms and safety shutdowns
- Optional DC logic system for simplified maintenance
- Optional pre-wired engine, panel with terminal strips

AC GENERATOR

- Direct coupled, single bearing, 12 lead, reconnectable AC generator. Maintenance free brushless design
- All NL generators meet or exceed class society standards with Class "H" insulation, accessible diodes, oversized ball bearings, marine grade shafts and conservative 90°/50° heat rise ratings
- Engines and generators are torsionally matched for long life
- Automatic voltage regulator; ±0.5% regulation over the entire range from no load to full load
- Configured for isochronous frequency control with integral electronic governor control supplied by ECU

SPECIAL EQUIPMENT

- US EPA Tier III Marine certified on 60 Hz models
- Meets or exceeds the standards of most classification societies
- Welded steel base pan
- Belt guard
- Center bonded vibration isolation mounts
- Tough white Imron paint
- Operator's and parts manuals

CLASSIFICATION STANDARDS

ABS Type and Lloyd's Register approval Lloyd's Register states that Northern Lights marine generator sets have been successfully tested in accordance with relevant requirements of Lloyd's Register for Marine Generator applications.

ABS TYPE APPROVED PRODUCT

LLOYD'S REGISTER · LRQA

ISO 9001

GENERAL SPECIFICATIONS AND DIMENSIONS

AC Output※	**M1066A13**	**M1066H**
60 Hz, 1800 RPM[1] kW	**120 kW**	**185 kW**
50 Hz, 1500 RPM[1] kW w/ABS or Lloyds cert upon request	**N/A**	**155 kW**
Voltage regulation	Both Models:+/- 0.5%	
Frequency droop control	Both Models: Isochronous 0%	
Phase and power factor	Both Models: Three phase 0.8 power factor std.	
Generator full load temperature rise ✓	90°C at 50°C ambient	110°C at 50°C ambient
Lugger Diesel Engine Data		
Inline cylinders/aspiration/operating cycle	Both Models: I-6 / Turbo & Aftercooled / 4	
Displacement - cid (liter)	Both Models: 414 (6.8)	
Bore/stroke - inches (mm)	Both Models: 4.19 / 5 (106 / 127)	
Fuel injection pump type and control	Both Models: Electronic (HPCR)	
Engine Cooling System		
Approximate cooling capacity - gal (ltr)	Both Models: 6.5 (24.7)	
Freshwater pump capacity - 60/50Hz/gpm (lpm)	42 / N/A (160 / N/A)	60 / 50 (227 / 189)
Seawater pump capacity - 60/50Hz/gpm(lpm)	42 / N/A (159 / N/A)	42 / 35 (159 /133)
Heat rejection to jacket water -1800/1500 rpm BTU min	5977 / N/A	Consult factory
DC Electrical (12V standard, 24V optional)		
DC starting voltage - standard (optional)	Both Models: 12 (24)	
Min battery capacity - amp hr/12V CCA (24V CCA)	255 / 925 (625)	225 / 800 (570)
Starter rolling amps @ 0°C - 12VDC (24VDC)	Both Models: 920 (600)	
12 Volt battery cable size up to 10 ft (3m)	Both Models: 000	
Air		
Generator cooling air flow 1&3Ø - 60/50 Hz - cfm	1,110 / N/A	1,100 / 915
Air consumption - 60/50 Hz - cfm (m^3/m)	378 / N/A (10.7 / N/A)	523 / 454 (14.8 / 12.9)
Approx heat radiated to air - 60/50 Hz - BTU/min	1060 / N/A	1458 / 1353
Exhaust gas volume - 60/50Hz - cfm (m^3/m)	974 / N/A (27.6 / N/A)	1317 / 1112 (37.3 / 33.5)
Exhaust gas temp - 60/50Hz - F° (C°)	977° / N/A (525° / N/A)	927° / 980° (497° / 526°)
Max. exhaust back pressure - inch H^2O (mm H^2O)	Both models: 30 (762)	
Fuel		
Min suction and return line - in (mm)	Both models: 3/8 (9.5)	
Max fuel transfer pump suction lift & return line pressure - inch H^2O (kPa)	Both models: 36 (914)	
Max fuel flow to transfer pump at 60/50Hz - gph	22.4 / 20.8	22.3 / 20.6
Specific fuel consumption max load 60/50Hz - lbs.hp.hr	0.354 / 0.333	0.371 / 0.348
Approx. fuel rate⁂ 60/50Hz - gph (lph)	9.0 / 7.1 (34 / 27)	14.9 / 13.1 (56.5 / 49.6)
Dimensions and Weight * ʌ		
Length - inches (mm)	Both models: 90 (2,286)	
Width - inches (mm)	Both models: 42 (1,067)	
Height - inches (mm)	Both models: 41.5 (1,054)	
Weight - pounds (kilograms)	3,630 (1,646)	3,776 (1,713)
Sound Enclosure - Dimensions and Weight * ≈		
Length - inches (mm)	Both models: 90 (2,286)	
Width - inches (mm)	Both models: 42 (1,067)	
Height - inches (mm)	Both models: 42 (1,067)	
Weight - pounds (kilograms)	Both models: 436 (198)	

*** Dimensions provided for information only. Do not use for installation. Contact factory for installation drawings and info.**

NOTES:

CF = consult factory representative or www.northern-lights.com for current information.

※ Prime kW ratings for 3Ø at 0.8 power factor. Consult factory for deration factors.

✓ Lloyd's Register classed M1066H @ 50 Hz = 110°C temperature rise at 45°C ambient

⁂ Based on prime kW rating at 1800 and 1500 RPM. Fuel rate may vary depending on operating conditions.

ʌ Data for units with hydrolastic mounts, heat exchanger cooling and 3 phase generator ends. Dimensions and weight are affected by optional equipment, AC output, phase, exhaust and cooling configuration.

≈ Consult factory for data on enclosures for single phase sets or sets with InSep

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

NORTHERN LIGHTS

MECTRA SYNERGY

M150A13

FEATURES AND BENEFITS

ENGINE BLOCK
- Six cylinder, four cycle, in-line, liquid cooled, overhead valve, marine diesels based on heavy-duty industrial engine blocks.
- Balanced, forged crankshaft with induction hardened journals and rolled fillets for long life.
- Replaceable, wet cylinder liners for long life and low rebuild costs.
- Bimetallic valves with chrome stems and rotators.
- Replaceable valve seats and guides.
- Three ring aluminum alloy pistons with Ni-Resist insert for the top ring. Keystone piston ring reduces carbon buildup under light loads.
- Torsional crankshaft dampers help ensure smooth operation.
- A single poly-vee drive belt powers the alternator and jacket-water pump.

FUEL SYSTEM
- High pressure common rail fuel injection for smooth, clean delivery.
- Direct fuel injection systems
- Ring clamp fuel filters with air bleed and drain.
- Electric fuel pump integrated into primary fuel filter. Computer controlled priming for ease of operation.

LUBRICATION SYSTEM
- Positive displacement gear-type oil pump.
- Full flow, spin-on oil filter.
- Jacket-water, plate-type, full flow oil cooler reduces heat and prevents lube oil breakdown.
- Large capacity oil pan.
- A closed loop crankcase vent traps oil vapor to keep the engine room clean.

AIR SYSTEM
- Dry air filter silences intake noise.
- Turbocharger with jacket water cooled turbine housings for safety.
- Jacket water aftercooler provides optimized combustion and output.

COOLING SYSTEM
- Heat exchanger cooled.
- Gear driven sea water pump with flexible impeller made of bronze and stainless steel.
- Cast iron expansion tank with brass filler neck.
- Two thermostats for quick warm-ups and safety.
- Cast-iron exhaust manifold for reliable temperature control.

ESP AND DC ELECTRICAL SYSTEM
- Negative ground, 12 volt DC system has circuit breaker, starter motor and alternator with regulator. Relay board and senders for gauged panels standard.
- Standard S-3B remote control panel with engine hour meter, coolant temperature gauge, oil pressure gauge, DC voltage meter, start-stop and shutdown bypass switches. Additional optional panels help you specify the amount and type of information delivered.
- Low oil pressure and high coolant temperature safety shutdown system.

AC GENERATOR
- Direct coupled, single bearing, 12 lead, reconnectable AC generator. Maintenance free brushless design.
- All NL generators meet or exceed class society standards with Class "H" insulation, accessible diodes, oversized ball bearings, marine grade shafts and conservative 90°/50° heat rise ratings.
- Engines and generators are torsionally matched for long life.
- Automatic voltage regulator; ±0.5% regulation over the entire range from no load to full load.
- Configured for isochronous operation with integral electronic governor control supplied by ECU. Frequency droop available upon request.

SPECIAL EQUIPMENT
- US EPA Tier III compliant (60 Hz).
- IMO Tier 2 compliant (50 Hz).
- Welded steel base frame
- Belt guard
- Hydrolastic vibration isolation mounts
- Sparkling white IMRON® polyurethane paint
- Operator's and parts manuals

AC Output *		
60 Hz, 1800 RPM kW	**150 kW**	
50 Hz, 1500 RPM kW	**125 kW**	
Voltage regulation	+/- 0.5%	
Frequency droop control	Isochronous, 0.5 Hz, 1.7 Hz, 3.0 Hz	
Phase and power factor	Three phase 0.8 power factor std.	
Generator full load temperature rise	90°C temperature rise at 50°C ambient	
Lugger Diesel Engine Data		
Inline cylinders/aspiration/operating cycle	I-6 / Turbo & Aftercooled / 4	
Displacement - cid (liter)	414 (6.8)	
Bore/stroke - inches (mm)	4.19/5 (106/127)	
Fuel injection pump type and control	Electronic (HPCR)	
Cooling System (Heat exchanger cooled)	**60 Hz**	**50 Hz**
Heat rejection to jacket water - BTU min	10,473	8,498
Freshwater pump capacity - gpm (lpm)	51.2 (194)	42.4 (161)
Approximate cooling capacity - gal (ltr)	9.0 (34)	9.0 (34)
Seawater Pump Flow - gpm(lpm)	46 (173)	33 (124.9)
Max seawater pump suction head lift - ft (m)	9.8 (3)	9.8 (3)
Sea water pump inlet hose ID - in (mm)	2.0 (51)	2.0 (51)
Min. seawater inlet/discharge thru-hull - in (mm)	2.0 (51)	2.0 (51)
DC Electrical (12V standard, 24V optional)		
DC starting voltage - standard (optional)	12 (24)	
Min battery capacity - 12V CCA (24V CCA)	925 (625)	
Starter rolling amps @ 0°C - 12VDC (24VDC)	920 (600)	
12 Volt battery cable size up to 10 ft (3m)	000	
Air	**60 Hz**	**50 Hz**
Air consumption - cfm (m^3/m)	547 (15.5)	353 (10.0)
Approx heat radiated to air - BTU/min	2,040	1,700
Generator cooling air flow 1 & 3 Ø - cfm (m^3/m)	1,100(31)	915 (26)
Exhaust gas volume - cfm (m^3/m)	1,123 (32)	828 (23)
Exhaust gas temp - F° (C°)	703 (373)	849 (454)
Max. exhaust back pressure - inch H^2O (mm H^2O)	30 (762)	30 (762)
Wet exhaust elbow OD- in (mm)	5 (127)	5 (127)
Dry exhaust elbow in (mm)	4 (102)	4 (102)
Fuel		
Fuel injection pump type and control	High Pressure Common Rail	
Min suction - in (mm)	0.31 (8)	
Min return line - in (mm)	0.31 (8)	
Max fuel transfer pump suction lift - ft (m)	7.9 (2.4)	
Max fuel flow to transfer pump - gph	42.8	
Specific fuel consumption max load 60 hz - lbs/hp-hr	0.388	
Specific fuel consumption max load 50 hz - lbs/hp-hr	0.363	
Approx. fuel rate** at 60 Hz full load - gph (lph)	12.2 (46.1)	
Approx. fuel rate** at 50 Hz full load - gph (lph)	9.5 (36.1)	
Max Engine Operating Angle		
Continuous (with separate expansion tank)	25	
Intermittent (2 minutes)	35	
Dimensions and Weight	**Open genset**	**w/ enclosure**
Length - inches (mm)	84.4 (2144)	90.0 (2286)
Width - inches (mm)	38.3 (973)	42.0 (1067)
Height - inches (mm)	39.84 (1012)	42.0 (1067)
Weight - pounds (kilograms)	3495 (1585)	4212 (1911)

*. Prime kW ratings for 3 Ø at 0.8 power factor. Consult factory for deration factors.
**. Based on prime kW rating at 1800 and 1500 RPM. Fuel rate may vary depending on operating conditions.

^ **Dimensions provided for information only. Do not use for installation. Contact factory for installation drawings and info.**

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

NORTHERN LIGHTS

MECTRA SYNERGY

M200A13

175 kW (50 Hz, 1500 rpm, 3ph)

SPECIFICATIONS AND DIMENSIONS

AC Output	
50 Hz, 1500 RPM* kW	**175 kW**
Voltage regulation	0.5%
Frequency droop control	Isochronous 0%
Standard three phase power factor	0.8
Optional single phase power factor	1.0
Generator full load temperature rise (at 50°C ambient)	95°C
Inline cylinders/operating cycle**	I-6 / 4
Aspiration	Turbo &Aftercooled
Displacement - cid (liter)	549 (9.0)
Bore/stroke - inches (mm)	4.65/5.35 (118/136)
Fuel injection pump type and control	(HPCR) Electronic
Oil fill capacity - gal (ltr)	8.7 (31)
Cooling System (Heat exchanged standard, Keel cooled optional)	
Heat rejection to jacket water -BTU min	12,522
Standard cooling type	Heat Exchanged
Optional cooling type	Keel Cooled
Freshwater pump capacity - gpm (lpm)	70.8 (268)
Heat exchanger approx coolant capacity - gal (ltr)	11.1 (42)
HE seawater pump capacity - gpm (lpm)	79 (299)
HE max seawater pump suction head lift - ft (m)	9 (2.8)
HE sea water pump inlet hose ID - in (mm)	2.5 (63.5)
HE min. seawater inlet/discharge thru-hull - in (mm)	2.5 (63.5)
Genset/EATS and Enclosure Dimensions and Weight	
Length - in (mm)	124 (3137)
Width - in (mm)	42 (1067)
Height - in (mm)	82 (2091)
Weight - lbs (kg)	6970 (3161)

DC Electrical	
DC starting voltage - standard	24
Min battery capacity - amp hr (CCA)	255 (750)
Battery cable size up to 10 ft (3m)	2/0
Air (Based on standard three phase)	
Air consumption - cfm (m^3/m)	600 (17)
Approx heat radiated to air - BTU/min (kW)	2150 (37.8)
Generator cooling air flow cfm (m^3/m)	850 (24)
Exhaust gas volume - cfm (m^3/m)	1409 (40)
Exhaust gas temp - F° (C°)	847 (453)
Max. exhaust back Pressure - inch H^2O (mm H^2O)*	30 (762)
Dry exhaust elbow OD- in (mm)	4 (102)
Wet exhaust elbow OD- in (mm)	6 (152)
Fuel	
Fuel injection pump type and control	HPCR
Supplied and return Size	3/8 in NPT
Max fuel transfer pump suction lift - in (mm)	80 (2032)
Max fuel flow to transfer pump - gph (lph)	63.4 (240)
Specific fuel consumption max load - lbs/hp-hr (g/kW-hr)	0.383 (232)
Approx. full load fuel consumption - gph (lph)	14 (53)
Max Engine Operating Angle	
Continuous	20°
Intermittent (2 minutes) (with separate expansion tank)	30°
Dimensions and Weight	
Length - in (mm)	124 (3137)
Width - in (mm)	42 (1067)
Height - in (mm)	82 (2091)
Weight - lbs (kg)	6390 (2898)

** For units with exhaust after treatment, max back pressure can be 60 in H20 (1524 mm H20) with diminished performance. (50 Hz units only)*

FEATURES AND BENEFITS

ENGINE BLOCK - Six cylinder, four cycle, in-line, liquid cooled, overhead valve, marine diesels based on heavy-duty industrial engine blocks. Balanced, forged crankshaft with induction hardened journals and rolled fillets for long life. Replaceable, wet cylinder liners for long life and low rebuild costs. Bimetallic valves have chrome stems and rotators. Replaceable valve seats and guides. Three ring aluminum alloy pistons with Ni-Resist insert for the top ring. Keystone piston ring reduces carbon buildup under light loads. Torsional crankshaft dampers help ensure smooth operation. A single poly-vee drive belt powers the alternator. Gear driven coolant pump.

FUEL SYSTEM - High pressure common rail fuel injection for smooth, clean delivery. Direct fuel injection systems. Canister fuel filters include drain and sensors for low fuel pressure and water-in-fuel. Electric Fuel pump integrated into primary fuel filter. Computer controlled priming for ease of operation.

LUBRICATION SYSTEM - Positive displacement gear-type oil pump. Jacket-water, plate-type, full flow oil cooler reduces heat and prevents lube oil breakdown. Large capacity oil pan. A closed loop crankcase vent traps oil vapor to keep the engine room clean.

AIR SYSTEM - Dry air filter silences intake noise. Turbocharger with jacket water cooled turbine housings for safety. Jacket water aftercooler provides optimized combustion and output. No second keel cooler needed.

COOLING SYSTEM - Heat exchanger cooling: Gear driven with flexible impeller, sea water pump is bronze and stainless steel.

COOLING SYSTEM CONT'D- Cast expansion tank with brass filler neck. Two thermostats for quick warm-ups and safety. Cast-iron exhaust manifold has a jacket-water flow for even temperature control.

DC ELECTRICAL SYSTEM - Electronic System Profiler (ESP) supplies an SAE J1939 data stream through a CANbus plug. Optional engine monitor screen. Negative ground, 12 volt DC system has circuit breaker, starter motor and alternator with regulator. Relay board and senders for gauged panels standard. Standard S-3B remote control panel with engine hour meter, coolant temperature gauge, oil pressure gauge, DC voltage meter, start-stop and shutdown bypass switches. Additional optional panels help you specify the amount and type of information delivered. Low oil pressure and high coolant temperature safety shutdown system.

AC GENERATOR - Direct coupled, single bearing, 12 lead, re-connectable AC generator. Maintenance free brushless design. All NL generators meet or exceed class society standards with Class "H" insulation, accessible diodes, oversized ball bearings, marine grade shafts and conservative 95°/50° heat rise ratings. Engines and generators are torsionally matched for long life. Automatic voltage regulator; ±1/2% regulation over the entire range from no load to full load. Configured for isochronous frequency control with ECU electronic governor control.

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

NORTHERN LIGHTS M:CTRA SYNERGY

M1305 SERIES

185-300 kW, 60 Hz @ 1800 RPM
185-250 kW, 50 Hz @ 1500 RPM

FEATURES AND BENEFITS

THE STATE-OF-THE ART IN MARINE EQUIPMENT

The growing demands of the marine marketplace demand a big, robust power producer. As the world's yachts grow more sophisticated, their power generation system must keep pace.

Northern Lights generator sets are based on world-class components - including industrial strength base engines and generator ends. Our exclusive marinization process ensures reliable, clean power no matter what your vessel requires.

LOW PROFILE FOR MAXIMUM ENGINE ROOM FLEXIBILITY

Northern Lights' revolutionary base frame design creates the most compact, best looking power generation set on the market. Our optional sound enclosures and compound mounts save even more space and virtually eliminate vibration and noise. Northern Lights provides maximum power efficiency while using minimal engine room space.

ELECTRONIC CONTROL SYSTEM

For the ultimate in system management and monitoring, the M1305 series is equipped with an Electronic Control Unit (ECU). The ECU controls the electronic engine functions and provides a SAE J1939 data stream of engine information that can be shown on an optional system monitor panel.

SUPERIOR PMG GENERATOR ENDS

Northern Lights generator ends achieve ±0.5% voltage regulation. All have low temperature rise ratings to meet or exceed marine requirements. All M1305's have Permanent Magnet Generators for 300% short circuit capability required for classed vessels.

COMPLETE UNIT TESTING

Northern Lights generator sets are thoroughly factory tested and go through a complete quality control program to ensure your satisfaction with the best built marine generator on the market today.

COMPONENT SPECIFIC FEATURES

ENGINE BLOCK

- Five cylinder, four cycle, in-line, liquid cooled, overhead valve, marine diesels based on heavy-duty industrial engine blocks
- Balanced alloy steel crankshaft with induction hardened journals and rolled fillets
- Replaceable valve seats and guides
- Strong three ring steel pistons for long-life reliability
- Gear-driven seawater pump
- Drive belt powers the alternator and freshwater pump
- Replaceable, strength-optimized wet cylinder liners for long life and low rebuild costs

FUEL SYSTEM

- Electronically controlled high-pressure fuel injection system provides individual control in each cylinder for low exhaust emissions and superior fuel economy
- High torque at low revolutions. (1800 or 1500 rpm)
- Full flow spin-on element with drain valve
- Gear driven fuel transfer pump with primer
- Flexible fuel lines routed to base frame for easy installation of vessel's hard piping

LUBRICATION SYSTEM

- 500 hour oil change interval when fuel and oil requirements are met
- Positive displacement gear-type oil pump
- Full flow, spin-on oil filter
- Centrifugal oil cleaner to extend oil change intervals
- Freshwater, plate-type, full flow oil cooler reduces heat and thermal breakdown of lube oil
- Large capacity oil pan
- Floating, cast aluminum, rocker cover traps valve noise with a separate closed breather system
- Lube oil drain for easy changes

AIR SYSTEM-TURBO AND AFTERCOOLER

- Dry air filter silences intake noise
- Dry exhaust elbow available in 5 inch (127 mm) or wet exhaust elbow available in 6 inch (152 mm)
- Aftercooler with marine quality, cupro-nickel, single pass element
- Turbocharged for increased output

COOLING SYSTEM

- Freshwater cooling system with twin thermostats for quicker warm-ups
- Heat exchanger cooling includes: Gear driven, flexible impeller seawater pump. Easy to clean, tube-type cupro-nickel heat exchanger
- Cast aluminum expansion tank with brass filler neck. Cast-iron exhaust manifold has single pass freshwater flow for even temperature control, fast warm-up and no hot spots • Cast aluminum expansion tank with brass filler neck.
- Zinc anode electrolysis protection

DC ELECTRICAL SYSTEM

- Engine supplies SAE J1939 data stream through a CAN bus plug for optional engine monitor
- Negative ground, 24 volt DC system with circuit breaker, starter motor and battery charging alternator with regulator. Isolated ground optional
- Standard digital controller displays engine hours, coolant temperature, oil pressure, DC voltage, and includes start-stop controls. Increased ease of paralleling through controller
- Engine and panel are pre-wired with terminal strips
- Low oil pressure and high coolant temperature safety shutdown system included in controller

AC GENERATOR

- Direct coupled, single bearing, 12 lead, reconnectable AC generator. Maintenance free brushless design
- Generators meet or exceed class society standards. All have class H insulation, accessible diodes, oversized ball bearings, marine grade shafts and conservative 95°/50° heat rise ratings
- Engines and generators are torsionally matched for long life
- Automatic voltage regulator gives fast response to electrical load changes. Voltage is regulated to ±0.5% (one half of one percent) over the entire range from no load to full load
- Isochronous electronic governor for 0% AC frequency droop
- PMG (permanent magnet generator) to power AVR for 300% short circuit capability for "classed" vessels

SPECIAL EQUIPMENT

- Standard hydrolastic mounts isolate 98% of hull vibration
- Welded steel base pan. Easy to mount and keep clean
- Belt guard protects operator even on sets in sound enclosures
- Sparkling white IMRON® polyurethane paint for protection and visibility
- Operator's and parts manuals

WORLD-CLASS OPTIONS

- Make your power generator system as unique as your boat. Northern Lights offers a comprehensive list of optional equipment including high power PTO's, super attenuated sound enclosures, customizable panels, and much more

CLASSIFICATION STANDARDS

- Meets or exceeds US EPA Tier II emission standards
- IMO 2 compliant, EU Stage IIIA
- Available certification from all major class societies including ABS, Lloyds Register, Germanischer Lloyd, DNV, Bureau Veritas, RINA, CCS and more (consult factory for additional societies and application information)

GENERAL SPECIFICATIONS AND DIMENSIONS

AC Output※	**M1305A12**	**M1305A22**	**M1305A32**	**M1305A42**
60 Hz, 1800 RPM¹ kW	**185 kW**	**200 kW**	**250 kW**	**300 kW**
50 Hz, 1500 RPM¹ kW	**185 kW**	**200 kW**	**250 kW**	**n/a**
Voltage regulation - PMG Std.	All: +/- 0.5%			
Frequency droop control	All: 0-10%			
Phase and power factor	3 phase, 0.8 PF			
Generator full load temperature rise	Max. 95°C/50°C			
Diesel Engine Data				
Inline Cylinders/Aspiration/Operating cycle	All: 5/Turbo & Aftercooled/4			
Displacement - cid (liter)	All: 567 (9.3)			
Bore/Stroke - inches (mm)	All: 5.12/5.5 (130/140)			
HP @ 1800 RPM (1500 RPM) ✓	267 (267)	291 (291)	360 (360)	435 (n/a)
Max. front power take off HP @ 60 Hz (50 Hz)	All: 202 (168)			
Oil capacity with filter - quarts (ltr)	All: 33.8 (30)			
Cooling System				
Approx. heat exchanger cooling capacity - gal (ltr)	All: 7.9 (30)			
Min. seawater inlet/discharge through hull dia. - in (mm)	All: 3.0 (75)			
Sea water pump inlet hose ID - in (mm)	All: 2.0 (51)			
Heat rejection to cooling water - 60 Hz BTU min	8,644	9,156	10,976	13,250
50 Hz BTU min	8,189	8,815	10,691	n/a
Seawater pump capacity - 60 Hz - gpm (lpm)	All: 66 (250)			
50 Hz - gpm (lpm)	All: 57 (215)			
Max. seawater pump suction head - in (m)	78 (2.0)			
Consult factory for keel and skin cooler sizing				
DC Electrical				
DC starting voltage - standard (optional)	All: 24			
Min battery capacity - amp hr/CCA (24V CCA)	All: 160 (800)			
Starter rolling amps @ 0°C - (24VDC)	All: 400			
Air				
Generator cooling air flow - 60 Hz/cfm	1100	1020	880	880
50 Hz/cfm	850	850	660	n/a
Air consumption - 60 Hz - cfm (m^3/m)	588 (16.7)	588 (16.7)	617 (17.5)	647 (18.3)
50 Hz - cfm (m^3/m)	500 (14.2)	529 (15.0)	559 (15.8)	n/a
Exhaust gas volume - 60 Hz - cfm (m^3/m)	1283 (36.3)	1358 (38.4)	1604 (45.4)	1985 (56.1)
50 Hz - cfm (m^3/m)	1155 (32.6)	1237 (35.0)	1467 (41.5)	n/a
Exhaust gas temp - 60 Hz - F° (C°)	671 (355)	738 (392)	826 (441)	999 (537)
50 Hz - F° (C°)	738 (392)	752 (400)	901 (483)	n/a
Approx. heat radiated to air - 60Hz - BTU/min	1064	1297	1488	1877
50Hz - BTU/min	1183	1297	1488	n/a
Max. Exhaust Back Pressure - inch H_2O (mm H_2O)	All: 30.0 (762)			
Wet exhaust Elbow OD- in (mm)	All: 6.0 (152)			
Fuel				
Fuel injection pump type and control	All: PDE unit injectors			
Min suction & return line - in (mm)	All: 0.5 (13)			
Max fuel transfer pump suction lift - in (mm)	All: 78.0 (2000)			
Max fuel flow to transfer pump - gph 60 Hz (50 Hz)	All: 85.9 (71.6)			
Full load fuel returned to tank - gph 60 Hz (50 Hz)	74.1 (60.1)	73.0 (59.2)	70.1 (59.1)	66.6 (n/a)
Specific fuel consumption max load - 60 Hz/lbs.hp.hr.	0.329	0.329	0.327	0.337
50 Hz/lbs.hp.hr.	0.319	0.317	0.322	n/a
Approx. fuel rate⁂ at 60 Hz full load - gph (lph)	11.8 (44.7)	12.9 (48.8)	15.8 (59.8)	19.3 (73.1)
50 Hz full load - gph (lph)	11.5 (43.5)	12.4 (46.9)	15.6 (59.1)	n/a
Maximum Engine Operating Angle				
Continuous (with separate expansion tank)	All: 12°			
Intermittent (2 minutes)	All: 20° Front/Rear; 30° Lateral			
Dimensions and Weight (See note ⅄ & ≈)				
Set length[5] - inch (mm)	86.4 (2200)	89.9 (2290)	94.9 (2410)	94.9 (2410)
Set width[5] - inch (mm)	40.2 (1020)	40.2 (1020)	40.2 (1020)	40.2 (1020)
Set height[5] - inch (mm)	49.2 (1250)	49.2 (1250)	49.2 (1250)	49.2 (1250)
Approx. dry weight[5] HE cooling - lbs (kg)	4690 (2130)	4900 (2240)	5480 (2490)	5480 (2490)
Sound enclosure[5] length - inch (mm)	107 (2720)	107 (2720)	107 (2720)	107 (2720)
Sound enclosure[5] width - inch (mm)	56 (1420)	56 (1420)	56 (1420)	56 (1420)
Sound enclosure[5] height - inch (mm)	55 (1400)	55 (1400)	55 (1400)	55 (1400)
Sound enclosure[5] weight - lbs (kg)	781 (355)	781 (355)	781 (355)	781 (355)
Base plate weight - lbs (kg)	584 (265)	584 (265)	584 (265)	584 (265)

NOTES:
Contact factory = consult factory representative or www.northern-lights.com for current information

※ Prime kW ratings for 3Ø at 0.8 power factor. Consult factory for deration factors.
✓ Net flywheel hp rating for fully equipped engine at rated speed under SAE J816b.
⁂ Based on prime kW rating at 1800 and 1500 RPM. Fuel rate may vary depending on operating conditions.
⅄ Data for units with hydrolastic mounts, heat exchanger cooling, dry exhaust and 3 phase generator ends. Dimensions and weight are affected by optional equipment, AC output, phase, exhaust and cooling configuration.
≈ Dimensions and weights are subject to change without notice, they are not intended for installations. Contact a factory representative for the current installation data.

NORTHERN LIGHTS®

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

NORTHERN LIGHTS®

MECTRA SYNERGY

M1266 SERIES

IMO Tier 2
205/310/415 kW, 60 Hz @ 1800 RPM
180/260/355 kW, 50 Hz @ 1500 RPM

IMO Tier 3
275/385 kW, 60 Hz @ 1800 RPM
275/340 kW, 50 Hz @ 1500 RPM

FEATURES AND BENEFITS

THE STATE-OF-THE ART IN MARINE EQUIPMENT

The growing demands of the marine marketplace demand a big, robust power producer. As the world's yachts grow more sophisticated, their power generation system must keep pace. Northern Lights generator sets are based on world-class components - including industrial strength base engines and generator ends. Our exclusive marinization process ensures reliable, clean power no matter what your vessel requires.

FLEXIBILITY

Northern Lights' revolutionary base frame design creates the most compact, best looking power generation set on the market. Our optional sound enclosures and compound mounts save even more space and virtually eliminate vibration noise. Northern Lights provides maximize power efficiency while using minimal engine room space.

ELECTRONIC CONTROL SYSTEM

For the ultimate in system management and monitoring, the M1266 series generator sets are equipped with an Electronic Control Unit (ECU). The ECU controls the electronic engine functions and provides a SAE J1939 data stream of engine information that can be displayed on an optional system monitor panel.

SUPERIOR PMG GENERATOR ENDS

Northern Lights generator ends achieve ±0.5% voltage regulation. All have low temperature rise ratings to meet or exceed marine requirements. All M1266's have Permanent Magnet Generators for 300% short circuit capability required for classed vessels.

COMPLETE UNIT TESTING

Northern Lights generator sets are thoroughly factory tested and go through a complete quality control program to ensure your satisfaction with the best built marine generator on the market today.

COMPONENT SPECIFIC FEATURES

ENGINE BLOCK

- Six cylinder, four cycle, in-line, liquid cooled, overhead valve, marine diesels based on heavy-duty industrial engine blocks
- Balanced alloy steel and induction hardened crankshaft
- Replaceable valve seats and guides
- Strong three ring steel pistons for long-life reliability
- Gear-driven seawater pump and freshwater pump
- Drive belt powers the alternator
- Replaceable, strength-optimized wet cylinder liners for long life and low rebuild costs

FUEL SYSTEM

- Electronically controlled high-pressure fuel injection system provides individual control in each cylinder for low exhaust emissions and superior fuel economy.
- High torque at low revolutions. (1800 or 1500 rpm)
- Full flow spin-on duplex elements
- Gear driven fuel transfer pump with primer
- Flexible fuel lines routed to fuel manifold on base frame for easy installation of vessel's hard piping

LUBRICATION SYSTEM

- 600 hour oil change interval when fuel and oil requirements are met
- Force feed lubricating by gear oil pump
- Full flow, spin-on oil filter
- Centrifugal oil cleaner to extend oil change intervals
- Freshwater, plate-type, full flow oil cooler reduces heat and thermal breakdown of lube oil
- Large capacity oil pan
- Floating, cast aluminum, rocker cover
- Lube oil drain for easy changes

AIR SYSTEM-TURBO AND AFTERCOOLER

- Dry air filter silences intake noise
- Aftercooler with marine quality, cupro-nickel, single pass element
- Turbocharged for increased output

COOLING SYSTEM

- Freshwater cooling system with three thermostats for quicker warm-ups
- Heat exchanger cooling includes: Gear driven, flexible impeller seawater pump.
- Cast aluminum expansion tank with brass filler neck. Cast-iron exhaust manifold has single pass freshwater flow for even temperature control, fast warm-up and no hot spots
- Titanium plate exchanger - no zinc anode protection necessary

DC ELECTRICAL SYSTEM

- Engine supplies SAE J1939 data stream through a CAN bus plug for optional engine monitor
- Negative ground, 24 volt DC system with circuit breaker, starter motor and battery charging alternator with regulator. Isolated ground optional
- Standard digital controller displays engine hours, coolant temperature, oil pressure, DC voltage, and includes start-stop controls. Increased ease of paralleling through controller
- Engine and panel are pre-wired with terminal strips
- Low oil pressure and high coolant temperature safety shutdown system included in controller

AC GENERATOR

- Direct coupled, single bearing, 12 lead, reconnectable AC generator. Maintenance free brushless design
- Generators meet or exceed class society standards. All have class H insulation, accessible diodes, oversized ball bearings, marine grade shafts and conservative 90°/50° heat rise ratings
- Engines and generators are torsionally matched for long life
- Automatic voltage regulator gives fast response to electrical load changes. Voltage is regulated to ±0.5% (one half of one percent) over the entire range from no load to full load
- Isochronous electronic governor for 0% AC frequency droop
- PMG (permanent magnet generator) to power AVR for 300% short circuit capability for "classed" vessels

SPECIAL EQUIPMENT

- Standard hydrolastic mounts isolate 98% of hull vibration
- Welded steel base pan. Easy to mount and keep clean
- Belt guard protects operator even on sets in sound enclosures
- Sparkling white IMRON® polyurethane paint for protection and visibility
- Operator's and parts manuals

WORLD-CLASS OPTIONS

- Make your power generator system as unique as your boat. Northern Lights offers a comprehensive list of optional equipment including high power PTO's, super attenuated sound enclosures, customizable panels, and much more

CLASSIFICATION STANDARDS

- IMO Tier 2 and Tier 3 compliant
- Available certification from CCS upon request

ISO 9001

Northern Lights, Inc. is ISO 9001 certified through Lloyds Register Quality Assurance

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

SPECIFICATIONS AND DIMENSIONS	M1266H12 1800 RPM, 60 Hz	M1266H12 1500 RPM, 50 Hz	M1266H13 1800 RPM, 60 Hz	M1266H13 1500 RPM, 50 Hz	M1266H22 1800 RPM, 60 Hz	M1266H22 1800 RPM, 60 Hz	M1266H23 1800 RPM, 60 Hz	M1266H23 1800 RPM, 60 Hz	M1266H32 1800 RPM, 60 Hz	M1266H32 1800 RPM, 60 Hz
AC Output - kW	205	180	275	275	310	260	385	340	415	355
Voltage Regulation	+/- 0.5%		+/- 0.5%		+/- 0.5%		+/- 0.5%		+/- 0.5%	
PMG	Standard		Standard		Standard		Standard		Standard	
Frequency droop	0-10%		0-10%		0-10%		0-10%		0-10%	
Phase/Power Factor	3/0.8		3/0.8		3/0.8		3/0.8		3/0.8	
Generator full load temp rise	Max 90°		Max 90°		Max 90°		Max 90°		Max 90°	
Diesel Engine Data										
No. of Cylinders	Inline 6		Inline 6		Inline 6		Inline 6		Inline 6	
Aspiration	Turbo & Aftercooled		Turbo & Aftercooled		Turbo & Aftercooled		Turbo & Aftercooled		Turbo & Aftercooled	
Operating cycle	4		4		4		4		4	
Displacement - in³	758		758		758		758		758	
Flywheel power - HP	295	255	396	396	443	375	550	483	597	503
Max. front power take off	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	
Oil capacity w/ filter - gal.	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	
Cooling System										
Approx. HE coolant capacity - gal.	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	
Min. seawater inlet/discharge dia. thru hull - inch	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	
Seawater pump inlet hose ID - inch	2.95		2.95		2.95		2.95		2.95	
Heat rejection to jacket water - BTU/min	7864	6830	7969	7969	7969	7969	10246	86387	10815	9107
Freshwater pump capacity - gpm	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	
Seawater pump capacity - gpm	92.5	74	92.5	74	92.5	74	92.5	74	92.5	74
Max. seawater pump suction head - inch	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	
DC Electrical										
DC starting voltage - standard	24		24		24		24		24	
Min. battery capacity - amp hr/24V CCA	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	
Starter rolling amps @ 32°F - 24VDC	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	
Air										
Generator cooling air flow - CFM	1020	850	880	730	880	730	1550	1280	1520	1255
Air consumption - CFM	566	418	813	660	819	583	1025	795	954	795
Exhaust gas volume - CFM	1478	1184	1984	1784	2072	1666	2708	2149	2655	2237
Exhaust gas temp °F	907	1018	842	970	887	1044	941	979	1004	1018
Approx. heat radiated to air - BTU/min	1480		1480		1480		1480		1480	
Max. exhaust back pressure - inch H2O	32		32		32		32		32	
Fuel										
Fuel injection pump type & control	HPCR Electronic		HPCR Electronic		HPCR Electronic		HPCR Electronic		HPCR Electronic	
Min. suction & return line - inch	0.47		0.47		0.47		0.47		0.47	
Max. fuel transfer pump suction lift - inch H2O	59		59		59		59		59	
Fuel delivery rate - gph	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	
Specific fuel consumption max load - lb/kW*h	0.342	0.345	0.329	0.322	0.327	0.334	0.332	0.321	0.326	0.329
Approx. full load fuel rate - gph	14.2	12.7	18.5	18.2	20.6	18	26.2	22.2	27.7	23.5
Full load fuel returned to tank -gph										
Max. engine operating angle - continuous	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	
Max. engine operating angle - intermittent	30°		30°		30°		30°		30°	
Dimensions and Weight										
Length - inches	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	
Width - inches	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	
Height - inches	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	
Approx. dry weight - lbs	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	
Sound enclosure LxWxH - inches	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

NORTHERN LIGHTS

MECTRA SYNERGY

M1266 SERIES

IMO Tier 2
205/310/415 kW, 60 Hz @ 1800 RPM
180/260/355 kW, 50 Hz @ 1500 RPM

IMO Tier 3
275/385 kW, 60 Hz @ 1800 RPM
275/340 kW, 50 Hz @ 1500 RPM

FEATURES AND BENEFITS

THE STATE-OF-THE ART IN MARINE EQUIPMENT

The growing demands of the marine marketplace demand a big, robust power producer. As the world's yachts grow more sophisticated, their power generation system must keep pace. Northern Lights generator sets are based on world-class components - including industrial strength base engines and generator ends. Our exclusive marinization process ensures reliable, clean power no matter what your vessel requires.

FLEXIBILITY

Northern Lights' revolutionary base frame design creates the most compact, best looking power generation set on the market. Our optional sound enclosures and compound mounts save even more space and virtually eliminate vibration noise. Northern Lights provides maximize power efficiency while using minimal engine room space.

ELECTRONIC CONTROL SYSTEM

For the ultimate in system management and monitoring, the M1266 series generator sets are equipped with an Electronic Control Unit (ECU). The ECU controls the electronic engine functions and provides a SAE J1939 data stream of engine information that can be displayed on an optional system monitor panel.

SUPERIOR PMG GENERATOR ENDS

Northern Lights generator ends achieve ±0.5% voltage regulation. All have low temperature rise ratings to meet or exceed marine requirements. All M1266's have Permanent Magnet Generators for 300% short circuit capability required for classed vessels.

COMPLETE UNIT TESTING

Northern Lights generator sets are thoroughly factory tested and go through a complete quality control program to ensure your satisfaction with the best built marine generator on the market today.

COMPONENT SPECIFIC FEATURES

ENGINE BLOCK

- Six cylinder, four cycle, in-line, liquid cooled, overhead valve, marine diesels based on heavy-duty industrial engine blocks
- Balanced alloy steel and induction hardened crankshaft
- Replaceable valve seats and guides
- Strong three ring steel pistons for long-life reliability
- Gear-driven seawater pump and freshwater pump
- Drive belt powers the alternator
- Replaceable, strength-optimized wet cylinder liners for long life and low rebuild costs

FUEL SYSTEM

- Electronically controlled high-pressure fuel injection system provides individual control in each cylinder for low exhaust emissions and superior fuel economy.
- High torque at low revolutions. (1800 or 1500 rpm)
- Full flow spin-on duplex elements
- Gear driven fuel transfer pump with primer
- Flexible fuel lines routed to fuel manifold on base frame for easy installation of vessel's hard piping

LUBRICATION SYSTEM

- 600 hour oil change interval when fuel and oil requirements are met
- Force feed lubricating by gear oil pump
- Full flow, spin-on oil filter
- Centrifugal oil cleaner to extend oil change intervals
- Freshwater, plate-type, full flow oil cooler reduces heat and thermal breakdown of lube oil
- Large capacity oil pan
- Floating, cast aluminum, rocker cover
- Lube oil drain for easy changes

AIR SYSTEM-TURBO AND AFTERCOOLER

- Dry air filter silences intake noise
- Aftercooler with marine quality, cupro-nickel, single pass element
- Turbocharged for increased output

COOLING SYSTEM

- Freshwater cooling system with three thermostats for quicker warm-ups
- Heat exchanger cooling includes: Gear driven, flexible impeller seawater pump.
- Cast aluminum expansion tank with brass filler neck. Cast-iron exhaust manifold has single pass freshwater flow for even temperature control, fast warm-up and no hot spots
- Titanium plate exchanger - no zinc anode protection necessary

DC ELECTRICAL SYSTEM

- Engine supplies SAE J1939 data stream through a CAN bus plug for optional engine monitor
- Negative ground, 24 volt DC system with circuit breaker, starter motor and battery charging alternator with regulator. Isolated ground optional
- Standard digital controller displays engine hours, coolant temperature, oil pressure, DC voltage, and includes start-stop controls. Increased ease of paralleling through controller
- Engine and panel are pre-wired with terminal strips
- Low oil pressure and high coolant temperature safety shutdown system included in controller

AC GENERATOR

- Direct coupled, single bearing, 12 lead, reconnectable AC generator. Maintenance free brushless design
- Generators meet or exceed class society standards. All have class H insulation, accessible diodes, oversized ball bearings, marine grade shafts and conservative 90°/50° heat rise ratings
- Engines and generators are torsionally matched for long life
- Automatic voltage regulator gives fast response to electrical load changes. Voltage is regulated to ±0.5% (one half of one percent) over the entire range from no load to full load
- Isochronous electronic governor for 0% AC frequency droop
- PMG (permanent magnet generator) to power AVR for 300% short circuit capability for "classed" vessels

SPECIAL EQUIPMENT

- Standard hydrolastic mounts isolate 98% of hull vibration
- Welded steel base pan. Easy to mount and keep clean
- Belt guard protects operator even on sets in sound enclosures
- Sparkling white IMRON® polyurethane paint for protection and visibility
- Operator's and parts manuals

WORLD-CLASS OPTIONS

- Make your power generator system as unique as your boat. Northern Lights offers a comprehensive list of optional equipment including high power PTO's, super attenuated sound enclosures, customizable panels, and much more

CLASSIFICATION STANDARDS

- IMO Tier 2 and Tier 3 compliant
- Available certification from CCS upon request

Northern Lights, Inc. is ISO 9001 certified through Lloyds Register Quality Assurance

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

SPECIFICATIONS AND DIMENSIONS	M1266H12 1800 RPM, 60 Hz	M1266H12 1500 RPM, 50 Hz	M1266H13 1800 RPM, 60 Hz	M1266H13 1500 RPM, 50 Hz	M1266H22 1800 RPM, 60 Hz	M1266H22 1800 RPM, 60 Hz	M1266H23 1800 RPM, 60 Hz	M1266H23 1800 RPM, 60 Hz	M1266H32 1800 RPM, 60 Hz	M1266H32 1800 RPM, 60 Hz
AC Output - kW	205	180	275	275	310	260	385	340	415	355
Voltage Regulation	+/- 0.5%		+/- 0.5%		+/- 0.5%		+/- 0.5%		+/- 0.5%	
PMG	Standard		Standard		Standard		Standard		Standard	
Frequency droop	0-10%		0-10%		0-10%		0-10%		0-10%	
Phase/Power Factor	3/0.8		3/0.8		3/0.8		3/0.8		3/0.8	
Generator full load temp rise	Max 90°		Max 90°		Max 90°		Max 90°		Max 90°	
Diesel Engine Data										
No. of Cylinders	Inline 6		Inline 6		Inline 6		Inline 6		Inline 6	
Aspiration	Turbo & Aftercooled		Turbo & Aftercooled		Turbo & Aftercooled		Turbo & Aftercooled		Turbo & Aftercooled	
Operating cycle	4		4		4		4		4	
Displacement - liters	12.42		12.42		12.42		12.42		12.42	
Flywheel power - HP	220	190	295	295	330	280	410	360	445	375
Max. front power take off	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	
Oil capacity w/ filter - liters	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	
Cooling System										
Approx. HE coolant capacity - liters	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	
Min. seawater inlet/discharge dia. thru hull - mm	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	
Seawater pump inlet hose ID - mm	75		75		75		75		75	
Heat rejection to jacket water - kW	135	120	140	140	140	140	180	150	190	160
Freshwater pump capacity - lpm	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	
Seawater pump capacity - lpm	350	280	350	280	350	280	350	280	350	280
Max. seawater pump suction head - m	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	
DC Electrical										
DC starting voltage - standard	24		24		24		24		24	
Min. battery capacity - amp hr/24V CCA	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	
Starter rolling amps @ 0°C - 24VDC	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	
Air										
Generator cooling air flow - m^3/m	29	24	25	21	25	21	44	36	43	36
Air consumption - m^3/m	16	12	23	19	23	17	29	23	27	23
Exhaust gas volume - m^3/m	42	34	56	51	59	47	77	61	75	63
Exhaust gas temp °C	486	548	450	521	475	562	505	526	540	548
Approx. heat radiated to air - kW	26		26		26		26		26	
Max. exhaust back pressure - mm H2O	817		817		817		817		817	
Fuel										
Fuel injection pump type & control	HPCR Electronic		HPCR Electronic		HPCR Electronic		HPCR Electronic		HPCR Electronic	
Min. suction & return line - mm	12		12		12		12		12	
Max. fuel transfer pump suction lift - m	1.5		1.5		1.5		1.5		1.5	
Fuel delivery rate - lph	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	
Specific fuel consumption max load - g/kW*h	208	210	200	196	199	203	202	195	198	200
Approx. full load fuel rate - lph	54	48	70	69	78	68	99	84	105	89
Full load fuel returned to tank -lph	Consult Factory	Consult Factory	508	534						
Max. engine operating angle - continuous	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	
Max. engine operating angle - intermittent	30°		30°		30°		30°		30°	
Dimensions and Weight										
Length - mm	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	
Width - mm	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	
Height - mm	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	
Approx. dry weight - kg	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	
Sound enclosure LxWxH - mm	Consult Factory		Consult Factory		Consult Factory		Consult Factory		Consult Factory	

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

NORTHERN LIGHTS

MECTRA SYNERGY

M1306 SERIES

355-400 kW, 60 Hz @ 1800 RPM
300-400 kW, 50 Hz @ 1500 RPM

FEATURES AND BENEFITS

THE STATE-OF-THE ART IN MARINE EQUIPMENT

The growing demands of the marine marketplace demand a big, robust power producer. As the world's yachts grow more sophisticated, their power generation system must keep pace.

Northern Lights generator sets are based on world-class components - including industrial strength base engines and generator ends. Our exclusive marinization process ensures reliable, clean power no matter what your vessel requires.

LOW PROFILE FOR MAXIMUM ENGINE ROOM FLEXIBILITY

Northern Lights' revolutionary base frame design creates the most compact, best looking power generation set on the market. Our optional sound enclosures and compound mounts save even more space and virtually eliminate vibration noise. Northern Lights provides maximize power efficiency while using minimal engine room space.

ELECTRONIC CONTROL SYSTEM

For the ultimate in system management and monitoring, the M1306 series generator sets are equipped with an Electronic Control Unit (ECU). The ECU controls the electronic engine functions and provides a SAE J1939 data stream of engine information that can be displayed on an optional system monitor panel.

SUPERIOR PMG GENERATOR ENDS

Northern Lights generator ends achieve ±0.5% voltage regulation. All have low temperature rise ratings to meet or exceed marine requirements. All M1306's have Permanent Magnet Generators for 300% short circuit capability required for classed vessels.

COMPLETE UNIT TESTING

Northern Lights generator sets are thoroughly factory tested and go through a complete quality control program to ensure your satisfaction with the best built marine generator on the market today.

COMPONENT SPECIFIC FEATURES

ENGINE BLOCK

- Six cylinder, four cycle, in-line, liquid cooled, overhead valve, marine diesels based on heavy-duty industrial engine blocks
- Balanced alloy steel crankshaft with induction hardened journals and rolled fillets
- Replaceable valve seats and guides
- Strong three ring steel pistons for long-life reliability
- Gear-driven seawater pump
- Drive belt powers the alternator and freshwater pump
- Replaceable, strength-optimized wet cylinder liners for long life and low rebuild costs

FUEL SYSTEM

- Electronically controlled high-pressure fuel injection system provides individual control in each cylinder for low exhaust emissions and superior fuel economy.
- High torque at low revolutions. (1800 or 1500 rpm)
- Full flow spin-on duplex elements
- Gear driven fuel transfer pump with primer
- Flexible fuel lines routed to fuel manifold on base frame for easy installation of vessel's hard piping

LUBRICATION SYSTEM

- 500 hour oil change interval when fuel and oil requirements are met
- Positive displacement gear-type oil pump
- Full flow, spin-on oil filter
- Centrifugal oil cleaner to extend oil change intervals
- Freshwater, plate-type, full flow oil cooler reduces heat and thermal breakdown of lube oil
- Large capacity oil pan
- Floating, cast aluminum, rocker cover traps valve noise with a separate closed breather system
- Lube oil drain for easy changes

AIR SYSTEM-TURBO AND AFTERCOOLER

- Dry air filter silences intake noise
- Dry exhaust elbow available in 5 inch (127 mm) or 6 inch (152 mm)
- Aftercooler with marine quality, cupro-nickel, single pass element
- Turbocharged for increased output

COOLING SYSTEM

- Freshwater cooling system with twin thermostats for quicker warm-ups
- Heat exchanger cooling includes: Gear driven, flexible impeller seawater pump. Easy to clean, tube-type cupro-nickel heat exchanger
- Cast aluminum expansion tank with brass filler neck. Cast-iron exhaust manifold has single pass freshwater flow for even temperature control, fast warm-up and no hot spots
- Zinc anode electrolysis protection

DC ELECTRICAL SYSTEM

- Engine supplies SAE J1939 data stream through a CAN bus plug for optional engine monitor
- Negative ground, 24 volt DC system with circuit breaker, starter motor and battery charging alternator with regulator. Isolated ground optional
- Standard digital controller displays engine hours, coolant temperature, oil pressure, DC voltage, and includes start-stop controls. Increased ease of paralleling through controller
- Engine and panel are pre-wired with terminal strips
- Low oil pressure and high coolant temperature safety shutdown system included in controller

AC GENERATOR

- Direct coupled, single bearing, 12 lead, reconnectable AC generator. Maintenance free brushless design
- Generators meet or exceed class society standards. All have class H insulation, accessible diodes, oversized ball bearings, marine grade shafts and conservative 90°/50° heat rise ratings
- Engines and generators are torsionally matched for long life
- Automatic voltage regulator gives fast response to electrical load changes. Voltage is regulated to ±0.5% (one half of one percent) over the entire range from no load to full load
- Isochronous electronic governor for 0% AC frequency droop
- PMG (permanent magnet generator) to power AVR for 300% short circuit capability for "classed" vessels

SPECIAL EQUIPMENT

- Standard hydrolastic mounts isolate 98% of hull vibration
- Welded steel base pan. Easy to mount and keep clean
- Belt guard protects operator even on sets in sound enclosures
- Sparkling white IMRON® polyurethane paint for protection and visibility
- Operator's and parts manuals

WORLD-CLASS OPTIONS

- Make your power generator system as unique as your boat. Northern Lights offers a comprehensive list of optional equipment including high power PTO's, super attenuated sound enclosures, customizable panels, and much more

CLASSIFICATION STANDARDS

- Meets or exceeds US EPA Tier III emission standards
- IMO 2 compliant
- Available certification from all major class societies including ABS, Lloyds Register, Germanischer Lloyd, DNV, Bureau Veritas, RINA, CCS and more (consult factory for additional societies and application information)

GENERAL SPECIFICATIONS AND DIMENSIONS

AC Output[×]	M1306A12	M1306A22	M1306A32
60 Hz, 1800 RPM[1] kW	**355 kW**	**400 kW**	**n/a**
50 Hz, 1500 RPM[1] kW	**300 kW**	**350 kW**	**400 kW**
Voltage regulation and PMG	±0.5% (PMG std)	±0.5% (PMG std)	±0.5% (PMG std)
Frequency droop control	0-10%	0-10%	0-10%
Phase and power factor	3 phase, 0.8	3 phase, 0.8	3 phase, 0.8
Generator full load temperature rise - C	Max. 90°	Max. 90°	Max. 90°
Diesel Engine Data			
Inline cylinders/Aspiration/Operating cycle	I-6/Turbo & Aftercooled/4	I-6/Turbo & Aftercooled/4	I-6/Turbo & Aftercooled/4
Displacement - cid (liter)	775 (12.7)	775 (12.7)	775 (12.7)
Bore/Stroke - inches (mm)	5.12/6.3 (130/160)	5.12/6.3 (130/160)	5.12/6.3 (130/160)
HP @ 1800 RPM (1500 RPM) √	504 (433)	571 (504)	n/a (571)
Max. front power take off HP @ 60 Hz (50 Hz)	303 (253)	303 (253)	n/a (253)
Oil capacity with filter - quarts (ltr)	35.9 (34)	35.9 (34)	35.9 (34)
Cooling System			
Approx. heat exchanger cooling capacity - gal (ltr)	10.6 (40)	10.6 (40)	10.6 (40)
Min. seawater inlet/discharge through hull dia. - in (mm)	3 (75)	3 (75)	3 (75)
Sea water pump inlet hose ID - in (mm)	2 (51)	2 (51)	2 (51)
Heat rejection to jacket water - 60 Hz BTU min	15,534	17,241	n/a
50 Hz BTU min	12,746	14,794	16,786
Freshwater pump capacity - 60 Hz - gpm (lpm)	139 (525)	139 (525)	n/a
50 Hz - gpm (lpm)	106 (400)	106 (400)	106 (400)
Seawater pump capacity - 60 Hz - gpm (lpm)	66 (250)	66 (250)	n/a (250)
50 Hz - gpm (lpm)	57 (215)	57 (215)	57 (215)
Max. seawater pump suction head - in (m)	118 (3)	118 (3)	118 (3)
Consult factory for keel and skin cooler sizing			
DC Electrical			
DC starting voltage - standard	24	24	24
Min battery capacity - amp hr/24V CCA	160 (800)	160 (800)	160 (800)
Starter rolling amps @ 0°C - 24VDC	400	400	400
Air			
Generator cooling air flow - 60 Hz/cfm	1,550	1,550	n/a
50 Hz/cfm	1,280	1,280	1,280
Air consumption - 60 Hz - cfm (m^3/m)	970 (27.5)	1,000 (28.3)	n/a
50 Hz - cfm (m^3/m)	764 (21.6)	853 (24.2)	911 (25.8)
Exhaust gas volume - 60 Hz - cfm (m^3/m)	2,493 (70.6)	2,740 (77.5)	n/a
50 Hz - cfm (m^3/m)	2,029 (57.4)	2,295 (64.9)	2,506 (70.9)
Exhaust gas temp - 60 Hz - F° (C°)	833 (445)	882 (472)	n/a
50 Hz - F° (C°)	865 (463)	889 (476)	921 (494)
Approx. heat radiated to air - 60Hz - BTU/min	2,447	2,788	n/a
50Hz - BTU/min	2,049	2,589	2,731
Max. Exhaust Back Pressure - inch H_2O (mm H_2O)	30 (762)	30 (762)	30 (762)
Fuel			
Fuel injection pump type and control	PDE unit injectors	PDE unit injectors	PDE unit injectors
Min suction & return line - in (mm)	0.5 (13)	0.5 (13)	0.5 (13)
Max fuel transfer pump suction lift - in (mm)	79 (2000)	79 (2000)	79 (2000)
Max fuel flow to transfer pump - gph 60 Hz (50 Hz)	85.9 (71.6)	85.9 (71.6)	n/a (71.6)
Full load fuel returned to tank - gph 60 Hz (50 Hz)	62.4 (52.2)	59.7 (49.1)	n/a (45.9)
Specific fuel consumption max load - 60 Hz/lbs.hp.hr.	0.337	0.334	n/a
50 Hz/lbs.hp.hr.	0.329	0.327	0.327
Approx. fuel rate ⁂ at 60 Hz full load - gph (lph)	23.5 (88.9)	26.2 (99.2)	n/a
50 Hz full load - gph (lph)[3]	19.4 (73.4)	22.5 (85.2)	25.7 (97.3)
Maximum Engine Operating Angle			
Continuous (with separate expansion tank)	12°	12°	12°
Intermittent (2 minutes)	25° front,rear/30° lateral	25° front,rear/30° lateral	25° front,rear/30° lateral
Dimensions and Weight λ ⇜			
Set length[5] - inch (mm)	107.0 (2,720)	107.0 (2,720)	107.0 (2,720)
Set width[5] - inch (mm)	38.6 (981)	38.6 (981)	38.6 (981)
Set height[5] - inch (mm)	52.6 (1,340)	52.6 (1,340)	52.6 (1,340)
Approx. dry weight[5] HE cooling - lbs (kg)	6,350 (2,880)	6,670 (3,025)	6,700 (3,040)
Sound enclosure[5] - L x W x H - inch (mm)	**All:** 119.0 (3,010) x 56.0 (1,420) x 55.0 (1,400)		
Sound enclosure[5] weight - lbs (kg)	846 (385)	846 (385)	846 (385)
Base plate weight - lbs (kg)	650 (296)	650 (296)	650 (296)

NOTES:
Contact factory = consult factory representative or www.northern-lights.com for current information

× Prime kW ratings for 3Ø at 0.8 power factor. Consult factory for deration factors.
√ Net flywheel hp rating for fully equipped engine at rated speed under SAE J816b.
⁂ Based on prime kW rating at 1800 and 1500 RPM. Fuel rate may vary depending on operating conditions.
λ Data for units with hydrolastic mounts, heat exchanger cooling and 3 phase generator ends. Dimensions and weight are affected by optional equipment, AC output, phase, exhaust and cooling configuration.
⇜ Dimensions are subject to change without notice, they are not intended for installations. Contact a factory representative for the current installation data.

NORTHERN LIGHTS®

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

NORTHERN LIGHTS®

MECTRA SYNERGY

M1308 SERIES

435-545 kW / 400-475 kW

FEATURES AND BENEFITS

THE STATE-OF-THE ART IN MARINE EQUIPMENT

The growing demands of the marine marketplace demand a big, robust power producer. As the world's yachts grow more sophisticated, their power generation system must keep pace.

Northern Lights generator sets are based on world-class components - including industrial strength base engines and generator ends. Our exclusive marinization process ensures reliable, clean power no matter what your vessel requires.

ELECTRONIC SYSTEM PROFILER

The M1308 series comes standard with a ComAp InteliGen NT marine panel for switchgear mounting which displays engine and AC data. The ECU that controls the electronic fuel injection provides a SAE J1939 data stream of engine information that can be shown on an optional system monitor panel.

SUPERIOR PMG GENERATOR ENDS

Northern Lights generator ends achieve ±0.5% voltage regulation. All have low temperature rise ratings to meet or exceed marine requirements. All M1308's have Permanent Magnet Generators for 300% short circuit capability required for classed vessels.

COMPREHENSIVE OPTIONS LIST

Each option is designed to integrate into a total power system specifically designed for your vessel. Consider a high power PTO, world class sound enclosure or customizable control panel to make your generator set as unique as your boat.

COMPLETE UNIT TESTING

Northern Lights generator sets are thoroughly factory tested and go through a complete quality control program to ensure your satisfaction with the best built marine generator on the market today.

COMPONENT SPECIFIC FEATURES

ENGINE BLOCK

- Vee-eight cylinder, four cycle, liquid cooled, overhead valve, marine diesels based on heavy-duty industrial engine blocks
- Balanced, alloy steel crankshaft with hardened and polished bearing surfaces
- High position alloy steel camshaft and pistons
- Three ring aluminum alloy pistons with Ni-Resist insert for the top ring. Keystone piston ring reduces carbon buildup under light loads
- Two gear-driven, counter-rotating balancing shafts for smooth operation
- Eight groove poly-vee drive belt powers the alternator and freshwater pump
- Replaceable, strength-optimized wet cylinder liners for long life and low rebuild costs

FUEL SYSTEM

- Electronically controlled fuel injection systems for low exhaust emissions and superior fuel economy
- High torque at low revolution. (1800 or 1500 rpm)
- Ring clamp fuel filter with air bleed and drain
- Diaphragm-type, mechanically driven fuel transfer pump with manual priming lever
- Flexible fuel lines routed to fuel manifold on base frame for easy installation of vessel's hard piping

LUBRICATION SYSTEM

- 500 hour oil change interval when fuel and oil requirements are met
- Positive displacement gear-type oil pump
- Full flow, spin-on oil filter
- Centrifugal oil cleaner reduces piston crown temperature for longer life
- Freshwater, plate-type, full flow oil cooler reduces heat and thermal breakdown of lube oil
- Large capacity oil pan
- Floating, cast aluminum, rocker cover traps valve noise and is a closed loop crankcase vent
- Lube oil drain for easy changes

AIR SYSTEM-TURBO AND AFTERCOOLER

- Closed crankcase ventilation
- Dry air filter silences intake noise
- After-cooler with aircraft quality, 70/30 cupro-nickel, two pass element
- Twin, isolated turbocharged for increased output. Fresh-water cooled turbine housings for safety

COOLING SYSTEM

- Freshwater cooling system with twin thermostats for quicker warm-ups
- Duel heat exchanger with expansion tanks. Gear driven, flexible impeller seawater pump. Easy to clean, tube-type cupro-nickel heat exchanger
- Cast iron expansion tank with brass filler neck. Cast-iron exhaust manifold has double pass freshwater flow for even temperature control, fast warm-up and no hot spots
- Zinc anode electrolysis protection

DC ELECTRICAL SYSTEM

- SAE J1939 data stream available through a CAN bus plug for optional engine monitor.
- Isolated ground 24 VDC system with circuit breaker, starter motor and battery charging alternator with regulator
- Standard ComAp InteliGen NT marine panel for switchgear mounting displays engine and AC data. Upgradable with enclosure, synchronizing and paralleling capability
- Low oil pressure and high coolant temperature safety shutdown system

AC GENERATOR

- Direct coupled, single bearing, 12 lead, reconnectable AC generator. Maintenance free brushless design
- Generators meet or exceed class society standards. All have class H insulation, accessible diodes, oversized ball bearings, marine grade shafts and conservative 95°/50° heat rise ratings
- Engines and generators are torsionally matched for long life
- Automatic voltage regulator gives fast response to electrical load changes. Voltage is regulated to ±0.5% (one half of one percent) over the entire range from no load to full load
- Isochronous electronic governor for 0% AC frequency droop
- PMG (permanent magnet generator) to power AVR for 300% short circuit capability for classed vessels

SPECIAL EQUIPMENT

- Standard hydrolastic mounts isolate 98% of hull vibration
- Welded steel base frame with drip pan. Easy to mount and keep clean
- Belt guard protects operator even on sets in sound enclosures
- Sparkling white IMRON® polyurethane paint for protection and visibility
- Operator's and parts manuals

CLASSIFICATION STANDARDS

- Meets or exceeds US EPA Tier III emission standards
- IMO compliant
- Consult factory for additional details

GENERAL SPECIFICATIONS AND DIMENSIONS

AC Output[×]	M1308A12	M1308A22	M1308A32	M1308A42	M1308A43
60 Hz, 1800 RPM[1] kW	**435 kW**	**475 kW**	**514 kW**	**545 kW**	**525 kW**
50 Hz, 1500 RPM[1] kW	**400 kW**	**420 kW**	**450 kW**	**475 kW**	
Voltage regulation and PMG	All models: +/-0.5%				
Frequency droop control	0-10%				
Phase and power factor	3 phase, 0.8 pf				
Generator full load temperature rise	Max 95°C/50°C				
Diesel Engine Data					
Cylinders/Aspiration/Operating cycle	All models: V-8/Turbo & Aftercooled/4				
Displacement - cid (liter)	1001 (16.4)				
Bore/Stroke - inches (mm)	5.12/6.1 (130/154)				
HP @ 1800 RPM (1500 RPM) ✓	628 (577)	685 (603)	742 (644)	799 (685)	742 (644)
Max. front power take off HP @ 60 Hz (50 Hz)	202 (168)				
Oil capacity with filter - quarts (ltr)	51 (48)				
Cooling System					
Approx. heat exchanger cooling capacity - gal (ltr)	All models: 17 (63)				
Min. seawater inlet/discharge through hull dia. - in (mm)	C/F				
Sea water pump inlet hose ID - in (mm)	C/F				
Heat rejection to jacket water - 60 Hz BTU/min (kW)	20,470 (360)	21,950 (386)	23,660 (416)	25,530 (449)	23,660 (416)
50 Hz BTU/min (kW)	17,910 (315)	18,650 (328)	19,960 (351)	21,380 (376)	19,960 (351)
Freshwater pump capacity - 60 Hz - gpm (lpm)	C/F				
50 Hz - gpm (lpm)	C/F				
Seawater pump capacity - 60 Hz - gpm (lpm)	66 (250)				
50 Hz - gpm (lpm)	57 (215)				
Max. seawater pump suction head - in (m)	118 (3)				
Consult factory for keel and skin cooler sizing	C/F				
DC Electrical					
DC starting voltage - standard (optional)	24				
Min battery capacity - amp hr/12V CCA (24V CCA)	C/F				
Starter rolling amps @ 0°C - 12VDC (24VDC)	C/F				
24 Volt battery cable size up to 10 ft (3m)	C/F				
Air					
Generator cooling air flow - 60 Hz/cfm	1536 (43.5)	1428 (40.5)	1428 (40.5)	C/F	1428 (40.5)
50 Hz/cfm	1280 (36.3)	1190 (33.7)	C/F	C/F	C/F
Air consumption - 60 Hz - cfm (m^3/m)	1160 (32.9)	1190 (33.7)	1250 (35.3)	1300 (36.9)	1250 (35.3)
50 Hz - cfm (m^3/m)	886 (25.1)	913 (25.9)	969 (27.4)	996 (28.2)	969 (27.4)
Exhaust gas volume - 60 Hz - cfm (m^3/m)	2960 (83.8)	3150 (89.2)	3350 (95.0)	3580 (101.0)	3350 (95.0)
50 Hz - cfm (m^3/m)	2510 (71.0)	2600 (73.5)	2700 (76.4)	2880 (81.5)	2700 (76.4)
Exhaust gas temp - 60 Hz - F° (C°)	761 (405)	781 (416)	806 (430)	837 (447)	806 (430)
50 Hz - F° (C°)	847 (453)	855 (457)	869 (465)	883 (473)	869 (465)
Approx. heat radiated to air - 60Hz - BTU/min (kW)	3108 (54.6)	3261 (57.3)	3525 (62.0)	C/F	3525 (62.0)
50Hz - BTU/min	2793 (49.1)	3033 (53.3)	3050 (53.6)	C/F	3060 (53.6)
Max. Exhaust Back Pressure - inch H_2O (mm H_2O)	All models: 30 (762)				
Wet exhaust Elbow OD- in (mm)	C/F				
Fuel					
Fuel injection pump type and control	All models: PDE/S6 EMS				
Min suction & return line - in (mm)	0.5 (13)				
Max fuel transfer pump suction lift - in (mm)	79 (2000)				
Max fuel flow to transfer pump - gph 60 Hz (50 Hz)	106 (100)				
Full load fuel returned to tank - gph 60 Hz (50 Hz)	73.7 (71.1)	71.1 (70.0)	68.4 (68.1)	64.6 (65.6)	68.4 (68.1)
Specific fuel consumption max load - 60 Hz - lbs./hp-hr.	0.366	0.332	0.331	0.332	0.331
50 Hz - lbs./hp-hr.	0.327	0.326	0.326	0.327	0.326
Approx. fuel rate ⁂ at 60 Hz full load - gph (lph)	32.3 (122)	34.9 (132)	37.6 (142)	41.4 (157)	37.6 (142)
50 Hz full load - gph (lph)[3]	28.9 (110)	30.0 (114)	31.9 (121)	34.4 (130)	31.9 (121)
Maximum Engine Operating Angle					
Continuous (with separate expansion tank)	All models: 12° front/rear, 10° lateral				
Intermittent (2 minutes)	25° front/rear, 30° lateral				
Dimensions and Weight (See note ⅄ & ⇜)					
Set length[⅄] - inch (mm)	All models: 106 (2683)				
Set width[⅄] - inch (mm)	48.2 (1224)				
Set height[⅄] - inch (mm)	51.7 (1314)				
Approx. dry weight[⅄] HE cooling 60 Hz - lbs (kg)	C/F	7607 (3450)	C/F	C/F	C/F
Approx. dry weight[⅄] HE cooling 50 Hz - lbs (kg)	C/F	7607 (3450)	C/F	C/F	C/F
Sound enclosure[⅄] - inch (mm)	C/F				
Sound enclosure[⅄] weight - lbs (kg)	C/F				
					IMO Tier III

NOTES:
C/F = Contact factory representative or www.northern-lights.com for current information

× Prime kW ratings for 3Ø at 0.8 power factor. Consult factory for deration factors.
✓ Net flywheel hp rating for fully equipped engine at rated speed under SAE J816b
⁂ Based on prime kW rating at 1800 and 1500 RPM. Fuel rate may vary depending on operating conditions.
⅄ Data for units with hydrolastic mounts, heat exchanger cooling and 3 phase generator ends. Dimensions and weight are affected by optional equipment, AC output, phase, exhaust and cooling configuration. Consult factory for data on enclosures for sets with InSep.
⇜ Dimensions are subject to change without notice, they are not intended for installations. Contact a factory representative for the current installation data.

NORTHERN LIGHTS

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

NORTHERN LIGHTS

MECTRA SYNERGY

M12812 SERIES

660-760 kW, 60 Hz @ 1800 RPM
570-660 kW, 50 Hz @ 1500 RPM

FEATURES AND BENEFITS

THE STATE-OF-THE ART IN MARINE EQUIPMENT
The growing demands of the marine marketplace demand a big, robust power producer. As the world's yachts grow more sophisticated, their power generation system must keep pace. Northern Lights generator sets are based on world-class components - including industrial strength base engines and generator ends. Our exclusive marinization process ensures reliable, clean power no matter what your vessel requires.

FLEXIBILITY
Northern Lights' revolutionary base frame design creates the most compact, best looking power generation set on the market. Our optional sound enclosures and compound mounts save even more space and virtually eliminate vibration noise. Northern Lights provides maximize power efficiency while using minimal engine room space.

ELECTRONIC CONTROL SYSTEM
For the ultimate in system management and monitoring, the M12812 series generator sets are equipped with an Electronic Control Unit (ECU). The ECU controls the electronic engine functions and provides a SAE J1939 data stream of engine information that can be displayed on an optional system monitor panel.

SUPERIOR PMG GENERATOR ENDS
Northern Lights generator ends achieve ±0.5% voltage regulation. All have low temperature rise ratings to meet or exceed marine requirements. All M12812's have Permanent Magnet Generators for 300% short circuit capability required for classed vessels.

COMPLETE UNIT TESTING
Northern Lights generator sets are thoroughly factory tested and go through a complete quality control program to ensure your satisfaction with the best built marine generator on the market today.

COMPONENT SPECIFIC FEATURES

ENGINE BLOCK
- V-12 cylinder, four cycle, liquid cooled, overhead valve, marine diesels based on heavy-duty industrial engine blocks
- Balanced alloy steel and induction hardened crankshaft
- Replaceable valve seats and guides
- Strong three ring steel pistons for long-life reliability
- Gear-driven seawater pump and freshwater pump
- Drive belt powers the alternator
- Replaceable, strength-optimized wet cylinder liners for long life and low rebuild costs

FUEL SYSTEM
- Electronically controlled high-pressure fuel injection system provides individual control in each cylinder for low exhaust emissions and superior fuel economy.
- High torque at low revolutions (1800 or 1500 rpm)
- Full flow spin-on duplex elements
- Gear driven fuel transfer pump with primer
- Flexible fuel lines routed to fuel manifold on base frame for easy installation of vessel's hard piping

LUBRICATION SYSTEM
- 600-hour oil change interval when fuel and oil requirements are met
- Force feed lubricating by gear oil pump
- Full flow, spin-on oil filter
- Oil cleaner is based on impactor technology to extend oil change intervals
- Freshwater, plate-type, full flow oil cooler reduces heat and thermal breakdown of lube oil
- Large capacity oil pan
- Floating, cast aluminum, rocker cover traps valve noise with a separate closed breather system
- Lube oil drain for easy changes

AC GENERATOR
- Direct coupled, single bearing, 12 lead, reconnectable AC generator. Maintenance free brushless design
- Generators meet or exceed class society standards. All have class H insulation, accessible diodes, oversized ball bearings, marine grade shafts and conservative 90°/50° heat rise ratings
- Engines and generators are torsionally matched for long life
- Automatic voltage regulator gives fast response to electrical load changes. Voltage is regulated to ±0.5% (one half of one percent) over the entire range from no load to full load
- Isochronous electronic governor for 0% AC frequency droop
- PMG (permanent magnet generator) to power AVR for 300% short circuit capability for "classed" vessels

AIR SYSTEM-TURBO AND AFTERCOOLER
- Dry air filter silences intake noise
- Aftercooler with marine quality, cupro-nickel, single pass element
- Turbocharged for increased output

COOLING SYSTEM
- Freshwater cooling system with three thermostats for quicker warm-ups
- Heat exchanger cooling includes: Gear driven, flexible impeller seawater pump.
- Cast aluminum expansion tank with brass filler neck. Cast-iron exhaust manifold has single pass freshwater flow for even temperature control, fast warm-up and no hot spots
- Titanium plate heat exchanger – no zinc anode protection necessary

DC ELECTRICAL SYSTEM
- Engine supplies SAE J1939 data stream through a CAN bus plug for optional engine monitor
- Negative ground, 24-volt DC system with circuit breaker, starter motor and battery charging alternator with regulator. Isolated ground optional
- Standard digital controller displays engine hours, coolant temperature, oil pressure, DC voltage, and includes start-stop controls. Increased ease of paralleling through controller
- Engine and panel are pre-wired with terminal strips
- Low oil pressure and high coolant temperature safety shutdown system included in controller

SPECIAL EQUIPMENT
- Standard hydrolastic mounts isolate 98% of hull vibration
- Welded steel base frame. Easy to mount and keep clean
- Belt guard protects operator even on sets in sound enclosures
- Sparkling white IMRON® polyurethane paint for protection and visibility
- Operator's and parts manuals

WORLD-CLASS OPTIONS
- Make your power generator system as unique as your boat. Northern Lights offers a comprehensive list of optional equipment including high power PTO's, super attenuated sound enclosures, customizable panels, and much more

CLASSIFICATION STANDARDS
- IMO Tier 2 and Tier 3 compliant
- Available certification from CCS upon request

ISO 9001

Northern Lights, Inc. is ISO 9001 certified through Lloyds Register Quality Assurance

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

SPECIFICATIONS AND DIMENSIONS	M12812H13 1800 RPM, 60 Hz	M12812H13 1500 RPM, 50 Hz	M12812H23 1800 RPM, 60 Hz	M12812H23 1500 RPM, 50 Hz
AC Output - kW	660	570	760	660
Voltage Regulation	+/- 0.5%		+/- 0.5%	
PMG	Standard		Standard	
Frequency droop	0-10%		0-10%	
Phase/Power Factor	3/0.8		3/0.8	
Generator full load temp rise	Max 90°		Max 90°	
Diesel Engine Data				
No. of Cylinders	V-12		V-12	
Aspiration	Turbo & Aftercooled		Turbo & Aftercooled	
Operating cycle	4		4	
Displacement - in^3	1479		1479	
Flywheel power - HP	940	805	1074	940
Max. front power take off	Consult Factory		Consult Factory	
Oil capacity w/ filter - gal	Consult Factory		Consult Factory	
Cooling System				
Approx. HE coolant capacity - gal	22.6		22.6	
Min. seawater inlet/discharge dia. thru hull - inch	Consult Factory		Consult Factory	
Seawater pump inlet hose ID - inch	2.95		2.95	
Heat rejection to jacket water - BTU/min	24,475	20,491	28,460	24,077
Freshwater pump capacity - gpm	243	214	264	230
Seawater pump capacity - gpm	129	111	129	111
Max. seawater pump suction head - inch	Consult Factory		Consult Factory	
DC Electrical				
DC starting voltage - standard	24		24	
Min. battery capacity - amp hr/24V CCA	Consult Factory		Consult Factory	
Starter rolling amps @ 32°F - 24VDC	Consult Factory		Consult Factory	
Air				
Generator cooling air flow - CFM	1220	1220	1150	890
Air consumption - CFM	1825	935	1707	1507
Exhaust gas volume - CFM	4073	1507	4503	3882
Exhaust gas temp °F	752	752	928	898
Approx. heat radiated to air - BTU/min	2220		2220	
Max. exhaust back pressure - inch H2O	32		32	
Fuel				
Fuel injection pump type & control	HPCR Electronic		HPCR Electronic	
Min. suction & return line - inch	0.79		0.79	
Max. fuel transfer pump suction lift - inch	59		59	
Fuel delivery rate - gph	185		185	
Specific fuel consumption max load - lb/HP*h	0.327	0.321	0.332	0.327
Approx. full load fuel rate - gph	43.8	36.7	50.7	43.8
Full load fuel returned to tank - gph	141.2	148.3	134.3	141.2
Max. engine operating angle - continuous	12.5°		12.5°	
Max. engine operating angle - intermittent	15°		15°	
Dimensions and Weight				
Length - inches	Consult Factory		Consult Factory	
Width - inches	Consult Factory		Consult Factory	
Height - inches	Consult Factory		Consult Factory	
Approx. dry weight - lbs	Consult Factory		Consult Factory	
Sound enclosure LxWxH - inches	Consult Factory		Consult Factory	

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

NORTHERN LIGHTS

MECTRA SYNERGY

M12812 SERIES

660-760 kW, 60 Hz @ 1800 RPM
570-660 kW, 50 Hz @ 1500 RPM

FEATURES AND BENEFITS

THE STATE-OF-THE ART IN MARINE EQUIPMENT
The growing demands of the marine marketplace demand a big, robust power producer. As the world's yachts grow more sophisticated, their power generation system must keep pace. Northern Lights generator sets are based on world-class components - including industrial strength base engines and generator ends. Our exclusive marinization process ensures reliable, clean power no matter what your vessel requires.

FLEXIBILITY
Northern Lights' revolutionary base frame design creates the most compact, best looking power generation set on the market. Our optional sound enclosures and compound mounts save even more space and virtually eliminate vibration noise. Northern Lights provides maximize power efficiency while using minimal engine room space.

ELECTRONIC CONTROL SYSTEM
For the ultimate in system management and monitoring, the M12812 series generator sets are equipped with an Electronic Control Unit (ECU). The ECU controls the electronic engine functions and provides a SAE J1939 data stream of engine information that can be displayed on an optional system monitor panel.

SUPERIOR PMG GENERATOR ENDS
Northern Lights generator ends achieve ±0.5% voltage regulation. All have low temperature rise ratings to meet or exceed marine requirements. All M12812's have Permanent Magnet Generators for 300% short circuit capability required for classed vessels.

COMPLETE UNIT TESTING
Northern Lights generator sets are thoroughly factory tested and go through a complete quality control program to ensure your satisfaction with the best built marine generator on the market today.

COMPONENT SPECIFIC FEATURES

ENGINE BLOCK
- V-12 cylinder, four cycle, liquid cooled, overhead valve, marine diesels based on heavy-duty industrial engine blocks
- Balanced alloy steel and induction hardened crankshaft
- Replaceable valve seats and guides
- Strong three ring steel pistons for long-life reliability
- Gear-driven seawater pump and freshwater pump
- Drive belt powers the alternator
- Replaceable, strength-optimized wet cylinder liners for long life and low rebuild costs

FUEL SYSTEM
- Electronically controlled high-pressure fuel injection system provides individual control in each cylinder for low exhaust emissions and superior fuel economy.
- High torque at low revolutions (1800 or 1500 rpm)
- Full flow spin-on duplex elements
- Gear driven fuel transfer pump with primer
- Flexible fuel lines routed to fuel manifold on base frame for easy installation of vessel's hard piping

LUBRICATION SYSTEM
- 600-hour oil change interval when fuel and oil requirements are met
- Force feed lubricating by gear oil pump
- Full flow, spin-on oil filter
- Oil cleaner is based on impactor technology to extend oil change intervals
- Freshwater, plate-type, full flow oil cooler reduces heat and thermal breakdown of lube oil
- Large capacity oil pan
- Floating, cast aluminum, rocker cover traps valve noise with a separate closed breather system
- Lube oil drain for easy changes

AC GENERATOR
- Direct coupled, single bearing, 12 lead, reconnectable AC generator. Maintenance free brushless design
- Generators meet or exceed class society standards. All have class H insulation, accessible diodes, oversized ball bearings, marine grade shafts and conservative 90°/50° heat rise ratings
- Engines and generators are torsionally matched for long life
- Automatic voltage regulator gives fast response to electrical load changes. Voltage is regulated to ±0.5% (one half of one percent) over the entire range from no load to full load
- Isochronous electronic governor for 0% AC frequency droop
- PMG (permanent magnet generator) to power AVR for 300% short circuit capability for "classed" vessels

AIR SYSTEM-TURBO AND AFTERCOOLER
- Dry air filter silences intake noise
- Aftercooler with marine quality, cupro-nickel, single pass element
- Turbocharged for increased output

COOLING SYSTEM
- Freshwater cooling system with three thermostats for quicker warm-ups
- Heat exchanger cooling includes: Gear driven, flexible impeller seawater pump.
- Cast aluminum expansion tank with brass filler neck. Cast-iron exhaust manifold has single pass freshwater flow for even temperature control, fast warm-up and no hot spots
- Titanium plate heat exchanger – no zinc anode protection necessary

DC ELECTRICAL SYSTEM
- Engine supplies SAE J1939 data stream through a CAN bus plug for optional engine monitor
- Negative ground, 24-volt DC system with circuit breaker, starter motor and battery charging alternator with regulator. Isolated ground optional
- Standard digital controller displays engine hours, coolant temperature, oil pressure, DC voltage, and includes start-stop controls. Increased ease of paralleling through controller
- Engine and panel are pre-wired with terminal strips
- Low oil pressure and high coolant temperature safety shutdown system included in controller

SPECIAL EQUIPMENT
- Standard hydrolastic mounts isolate 98% of hull vibration
- Welded steel base frame. Easy to mount and keep clean
- Belt guard protects operator even on sets in sound enclosures
- Sparkling white IMRON® polyurethane paint for protection and visibility
- Operator's and parts manuals

WORLD-CLASS OPTIONS
- Make your power generator system as unique as your boat. Northern Lights offers a comprehensive list of optional equipment including high power PTO's, super attenuated sound enclosures, customizable panels, and much more

CLASSIFICATION STANDARDS
- IMO Tier 2 and Tier 3 compliant
- Available certification from CCS upon request

ISO 9001

Northern Lights, Inc. is ISO 9001 certified through Lloyds Register Quality Assurance

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

SPECIFICATIONS AND DIMENSIONS	M12812H13 1800 RPM, 60 Hz	M12812H13 1500 RPM, 50 Hz	M12812H23 1800 RPM, 60 Hz	M12812H23 1500 RPM, 50 Hz
AC Output - kW	660	570	760	660
Voltage Regulation	+/- 0.5%		+/- 0.5%	
PMG	Standard		Standard	
Frequency droop	0-10%		0-10%	
Phase/Power Factor	3/0.8		3/0.8	
Generator full load temp rise	Max 90°		Max 90°	
Diesel Engine Data				
No. of Cylinders	V-12		V-12	
Aspiration	Turbo & Aftercooled		Turbo & Aftercooled	
Operating cycle	4		4	
Displacement - liters	24.24		24.24	
Flywheel power - kW	700	600	800	700
Max. front power take off	Consult Factory		Consult Factory	
Oil capacity w/ filter - liters	105		105	
Cooling System				
Approx. HE coolant capacity - liters	86		86	
Min. seawater inlet/discharge dia. thru hull - mm	Consult Factory		Consult Factory	
Seawater pump inlet hose ID - mm	75		75	
Heat rejection to jacket water - kW	430	360	500	423
Freshwater pump capacity - lpm	920	810	1000	870
Seawater pump capacity - lpm	490	420	490	420
Max. seawater pump suction head - m	Consult Factory		Consult Factory	
DC Electrical				
DC starting voltage - standard	24		24	
Min. battery capacity - amp hr/24V CCA	Consult Factory		Consult Factory	
Starter rolling amps @ 0°C - 24VDC	Consult Factory		Consult Factory	
Air				
Generator cooling air flow - m^3/m	35	35	33	26
Air consumption - m^3/m	52	43	48	43
Exhaust gas volume - m^3/m	115	98	128	110
Exhaust gas temp °C	400	752	928	898
Approx. heat radiated to air - kW	39		39	
Max. exhaust back pressure - mm H_2O	817		817	
Fuel				
Fuel injection pump type & control	HPCR Electronic		HPCR Electronic	
Min. suction & return line - mm	20		20	
Max. fuel transfer pump suction lift - m	1.5		1.5	
Fuel delivery rate - lph	700		700	
Specific fuel consumption max load - g/kW*h	199	195	202	199
Approx. full load fuel rate - lph	166	139	192	166
Full load fuel returned to tank -lph	534	561	508	534
Max. engine operating angle - continuous	12.5°		12.5°	
Max. engine operating angle - intermittent	15°		15°	
Dimensions and Weight				
Length - mm	Consult Factory		Consult Factory	
Width - mm	Consult Factory		Consult Factory	
Height - mm	Consult Factory		Consult Factory	
Approx. dry weight - kg	Consult Factory		Consult Factory	
Sound enclosure LxWxH - mm	Consult Factory		Consult Factory	

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

NORTHERN LIGHTS

MECTRA SYNERGY

TSC CONTROL SYSTEM

NMEA 2000 compatible multi-function display system

To keep pace with requirements for streaming electronics, Northern Lights is pleased to offer the ***TSC Control System.***

S-TSC CONTROL PANEL

The TSC control can be fitted with an optional shielded cable to interface with the ship's multi-function display, for a truly integrated and intuitive generator display experience.

- One touch run/stop function
- Customizable warnings and shutdowns
- Easy-to-read push buttons and backlit LED screen

FEATURES AND FUNCTIONS

- SAE J1939 CAN bus protocol
- RPM via J1939, magnetic pickup or generator
- Autostart even on low battery
- Manual and remote start
- Emergency stop
- Passcode protected for vessel security
- Maintenance timing counter
- Exerciser clock
- Tracking log for up to 150 events
- Designed to protect against moisture
- Common sensor (i.e. VDO, Datcon) compatibility.

AVAILABLE DISPLAYS

TSC offers the display data most critical to the proper maintenance and functionality of your Northern Lights generator set. Adding a NMEA2000 compatible cable allows S-TSC to access all of your vessel's most crucial data.

- Engine temperature
- Oil pressure
- Fuel level
- AC metering
- Battery voltage
- Engine speed
- Engine hours
- Text
- Time and date
- Custom senders
- Customizable warnings and shutdowns

NORTHERN LIGHTS

MECTRA SYNERGY

TSC CONTROL SYSTEM

NMEA 2000 compatible multi-function display system

PROGRAMMABLE ALARMS AND FUNCTIONS

Customize the amount of data that is most important to you.

- Overcrank
- Coolant temperature
- Oil pressure
- DC voltage
- Over/Under voltage
- Over/Under current
- Over/Under speed

Available with local and remote panel access,
with a sleek simple design that compliments any engine room.

DIMENSIONS (Height x Width x Depth)

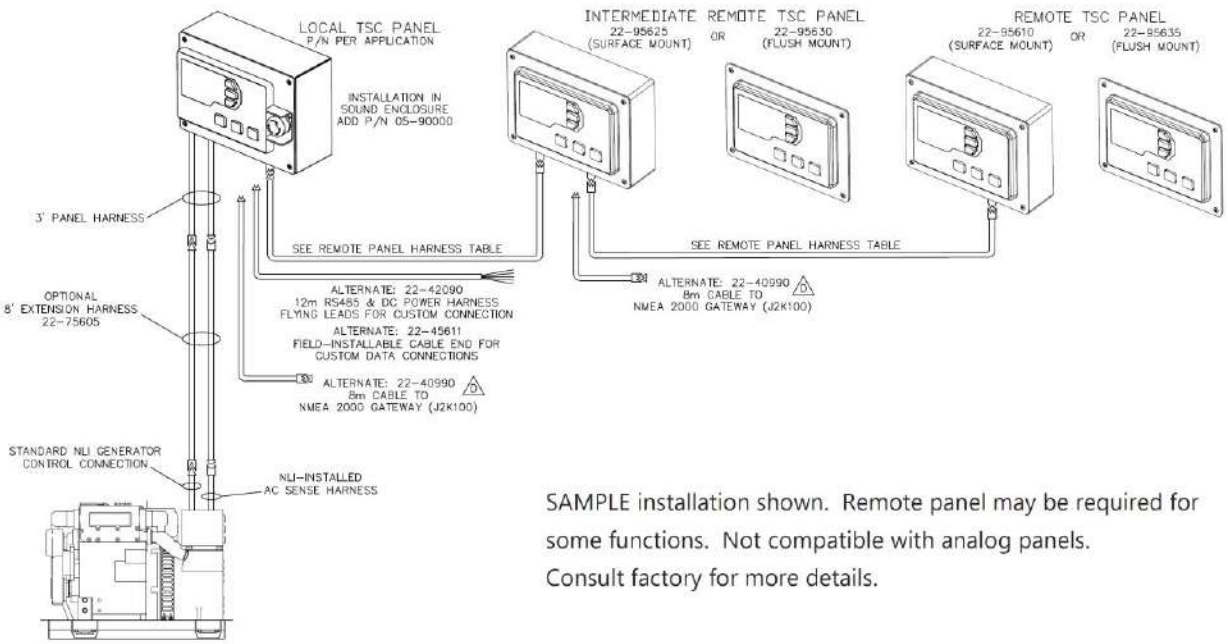
Module size: 4.2 in x 6.5 in x 1.4 in
106 mm x 165 mm 35 mm

Local panel enclosure: 5.9 in x 8.3 in x 3.1 in
149 mm x 210 mm x 78 mm

Remote panel enclosure: 5.9 in x 8.3 in x 2.4 in
149 mm x 210 mm x 59 mm

NMEA2000 Compatibility

- Available through custom cable, in lengths of 25' (7.5 meters).
- Remote paneling available up to 128' (39 meters).
- Interfaces the S-TSC's SAE J1939 CAN data stream to an NMEA 2000 gateway.
- Reliable twisted-pair cable with 8-pin/5-pin connectors.
- Available on units **up to 40kW**.



SAMPLE installation shown. Remote panel may be required for some functions. Not compatible with analog panels. Consult factory for more details.

Mectra Synergy (M) Sdn Bhd
B-G-31 Menara Prima, Jalan PJU 1/39
Dataran Prima, 47301, Petaling Jaya
Selangor Malaysia
Tel: +603 7996 1732
Email: sales@mectra.com.my
Website: www.mectra.com.my

MECTRA
SYNERGY

NORTHERN LIGHTS

MECTRA SYNERGY (M) SDN BHD
HEADQUARTERS
B-G-31 MENARA PRIMA, JALAN PJU 1/39
DATARAN PRIMA, 47301 PETALING JAYA
SELANGOR, MALAYSIA
TEL: +603 - 7886 1732
WHATSAPP/CALL: +60 11-6565 3467
EMAIL : sales@mectra.com.my
WEBSITE : www.mectra.com.my

BRANCH OFFICE

TOK BALI BRANCH
LOT 1190/1191
KAMPUNG PAK MAYONG
TOK BALI, SEMERAK,
16700 PASIR PUTEH,
KELANTAN, MALAYSIA

SANDAKAN BRANCH
LOT 5, BLOCK I,
GROUND FLOOR,
BATU 4 BANDAR KIM FUNG,
90000 SANDAKAN,
SABAH, MALAYSIA

JOHOR BRANCH
NO.27-01 JALAN SURIA 3,
BANDAR SERI ALAM,
81750 MASAI,
JOHOR, MALAYSIA

LUMUT BRANCH
NO.36, JALAN NAKHODA 1,
TAMAN NAHKODA,
32200 LUMUT,
PERAK, MALAYSIA

LANGKAWI BRANCH
LOT LG12,
ROYAL LANGKAWI YACHT
CLUB,
JALAN DATO SYED OMAR,
KUAH, 07000 LANGKAWI,
KEDAH, MALAYSIA