



# Dependable **Energy**



- ▶ DIESEL GENERATORS  
(5 kVA upto 3000 kVA)
- ▶ DIESEL ENGINE SPARES

Our Associates :



[www.MAKSgenerators.com](http://www.MAKSgenerators.com)



# A legacy of more than three decades

- ▶ **M. M. Diesel Spares (MMDS)** is a 40 years old business group with business interests varying from Manufacturing Diesel Generators, Rentals and Spares, Education, Breweries to Toyota Car Dealerships across India. **MMDS** group revenue in 2017 has crossed US \$1 Billion with global presence in Middle East & Africa.
- ▶ **MAKS Energy Solutions India Pvt. Ltd.** is the generator manufacturing arm of **MMDS** Group. **MAKS Energy** is OEM to multiple National and International Engine Brands of global repute. Under the brand name of **MAKS Generators**, the generators are exported worldwide.
- ▶ **MAKS Generators:**  
**Mission :** To manufacture full range of Generators sets and provide Energy Solutions, following technological development attentively. **MAKS Energy** provides generators that fully respond to our customers need and we ensure our clients live life uninterrupted, at competitive prices and backed by efficient after sales support.
- ▶ **Vision :** To be the Best Power Generators & Energy Solutions providers within the energy sector globally with regular growth. We believe in our staff & dealer network that in confident, disciplined and practical way solve the energy problems of our clients globally.



## Serving the globe

More than 35 years of experience in power generation and diesel engine engineering have enabled MMDS and MAKS Energy to provide entire range of energy solutions all over the globe. The product portfolio covers domestic as well as export oriented diesel generator units ranging from **3 kVA upto 3000 kVA**.

### Typical applications:

- ▶ Communication companies
- ▶ Construction sites
- ▶ Mining sites
- ▶ Data centres
- ▶ Government buildings
- ▶ Educational institutions
- ▶ Healthcare facilities
- ▶ Manufacturing, commercial and industrial facilities
- ▶ Residential complexes
- ▶ Malls, multiplexes and other entertainment complexes
- ▶ Hotels and restaurants
- ▶ IT and BPO establishments
- ▶ Convention centres

# Generator Features



**1. EMISSION OR FUEL OPTIMIZED ENGINE**  
Clean-running engines, featuring closed crank-case ventilation design. Available in emission or fuel optimized version to meet your requirement on emissions standards or low fuel consumption

**2. FUEL SYSTEMS**  
Common rail injection systems, designed specifically for the large diesel. Enables injection at a pressure up to 2200 bar for maximum efficiency

**3. HIGH-AMBIENT COOLING SYSTEMS**  
Designed to meet extreme operating conditions, segmented radiator core sections allow for single replacement instead of entire core. Cooling system designed to give full power up to ambient temperatures of 50°C

**4. EFFICIENT ALTERNATORS**  
Provide advanced short circuit capability & meet NEMA MG 1, IEEE & ANSI standards, multiple alternator options available

**5. GENERATOR CONTROLLERS**  
Generator Set Controller, designed to control all functions and guarantee optimal performance. The large touch screen on the ergonomic human-machine interface makes for easy operation on paralleling, load and generator management

**6. LOW COMBUSTION AIR**  
Requires less air to run, creating fewer emissions and enabling optimal performance inside an enclosure

**7. INNOVATIVE CYLINDER HEAD**  
An innovative cylinder head design enabling better circulation of fuel, more efficient combustion & optimized exhaust gas emission flow

**8. OPTIONS AND ACCESSORIES**  
Multiple circuit breakers, battery heaters, block heaters, battery charger, prelube pump and centrifugal oil filter

## Alternator:

- ▶ Stamford / Leroy-Sommer / Mecc-Alte Alternators.
- ▶ All Alternators are covered under Global Warranty.



Type	Brushless
Voltage	415 V
Speed/Frequency	1500 RPM/50 HZ
Power Factor	0.8 (lag)
Enclosure	IP23
Voltage Regulation (Max)	±1 % @ static conditions
Class of Insulation	Class H
Wiring	4 wire conforming BS5000/IS4722
Permissible Overload	10% for 1 hour every 6 hours

## Control Panel:



The control panel is manufactured with 14/16 gauge CRCA sheet and is powder coated for weather-proof and long-lasting finish.

### The control panel consists of following parts:

- ▶ DSE Controller / DEIF Controller / ComAp / Others
- ▶ Aluminium bus bars with suitable capacity with in/outgoing terminals Indicating lamps for 'Load On' and 'Set Running'
- ▶ Instrument fuses duly wired and ferruled
- ▶ MCCB of suitable rating with overload and short circuit protections

### Deep Sea Electronics (DSE) Genset Controller:

DSE is a micro-processor based generator set monitoring and control system. The control provides a simple operator interface to the generator set, and remote start/stop control, shutdown fault indication, and a LCD hour counter. The integration of all functions into a single control system provides enhanced reliability and performance compared to

conventional generator set control systems. This control has been designed and tested to meet harsh environment in which gensets are typically applied.

### Features:

- ▶ 16 character x 2 line alphanumeric LCD display with LED backlight
- ▶ Operator interface
- ▶ Provide a record of most recent fault conditions. Fault history stored in the control non-volatile memory

### Provides alternator data:

- ▶ Voltage (1 ph or 3 ph line to line and line to neutral voltage)
- ▶ Current (1 ph or 3 ph)
- ▶ kVA (3 ph and total)
- ▶ Frequency

### Provides engine data:

- ▶ Starting battery voltage
- ▶ Engine running hours
- ▶ Engine Temperature
- ▶ Engine oil pressure

### Control includes provision for service adjustment and calibration of DG control functions:

- ▶ Voltage, frequency selection
- ▶ Configurable input and output set up
- ▶ Meter calibration

### Engine controls:

- ▶ Deep Sea operates on 12 VDC batteries
- ▶ Auto start mode accepts a ground signal from remote devices to automatically start the DG set. The remote start will also wake up the control system from sleep mode.
- ▶ **Engine starting:** The control system supports automatic engine starting, primary and back up

start disconnects are achieved by battery charging alternator feedback or main alternator output frequency.

- ▶ Controller provide configurable time delay of 0-3 seconds to start after remote start signal and time delay of 0-6 secs prior to shutdown after stop signal.
- ▶ Sleep mode increases battery life. Configurable current settings from low to minimise current draw when genset is not working.

#### Engine protective functions include:

- ▶ Configurable alarm output
- ▶ **Emergency stop:** Annunciated whenever an emergency stop signal is received by the control.
- ▶ Low lube oil pressure warning and shutdown
- ▶ High engine water temperature warning / shutdown
- ▶ Low coolant temperature warning
- ▶ Sensor failure indication
- ▶ Low and high battery voltage warning
- ▶ Weak battery warning
- ▶ Fail to start/shutdown
- ▶ **Cranking lockout:** Control will not allow the starter to engage or to crank the running engine.
- ▶ **Cyclic cranking:** Configurable for the number of starting cycle (1 to 7) and duration of crank and rest periods.

#### Alternator protective functions include:

- ▶ High and low AC voltage shutdown
- ▶ Under and over-frequency shutdown / warning
- ▶ Loss of sensing voltage input shutdown

### Acoustic enclosure:

The acoustic enclosure is made of 2 mm thick CRCA sheets and a structural/sheet metal base frame painted in black is of 3 / 4 mm. The walls of enclosure are insulated with fire retardant foam so as to comply with levels specified by Ministry of Environment and Forests (MoEF).

#### The enclosure has the following features:

- ▶ Specially designed curve model acoustic to meet stringent MoEF / CPCB norms & sound of less than 75 dBA at 1 mtr. distance at 75% load under free field conditions.



- ▶ Central lifting provision for easy handling at Customer Site
- ▶ Designed to have optimum serviceability
- ▶ Air inlet louvers specially designed to operate at rated load
- ▶ Made on special purpose CNC machines for consistency in quality and workmanship
- ▶ Powder coated for long lasting service life and superior finish with 11 tank process
- ▶ With UV resistant powder coating, can withstand extreme environment
- ▶ Use of special hardware for longer life
- ▶ Insulation material meets exacting IS 8183 specifications for better sound attenuation
- ▶ Flush styling - no projections

#### Others:

- ▶ Fuel Tank Capacity of 150 - 990 litres and expandable

#### Optionals:

- ▶ Microprocessor / relay based AMF control panel
- ▶ Trolley mounted mobile sets
- ▶ Cold starting aid
- ▶ Electronic governor
- ▶ Lighting tower
- ▶ Welding generator
- ▶ AMF panel
- ▶ Remote Monitoring



**50Hz**

**1500 rev/min ( 9 kVA to 2250 kVA)**

Prime Rating (kVA)	kW	Engine Model	Fuel Tank Size (Ltr.)	Canopy Dimensions (mm)			Weight (KG)
				Length	Width	Height	
9	7.2	403D-11 E PAK	75	1750	800	1200	575
15	12	403 A-15 G2 E PAK	75	1750	800	1200	575
20	16	404D-22-E PAK-U	75	1750	800	1200	650
30	24	1103 A-33G-E PAK-U	90	2200	950	1450	1005
45	36	1103 A-33TG1-E PAK-U	90	2200	950	1450	1055
60	48	1103 A-33TG2	160	2650	950	1450	1150
80	64	1104 A -44TG2	160	2650	950	1450	1285
100	80	1104 C-44TAG2	230	2659	721	1450	1420
135	108	1106 A-70TG1	260	3320	1100	1600	1800
150	120	1106 A-70TAG2	260	3900	1100	1900	2300
180	144	1106A-70TAG3	330	3900	1200	1900	2350
200	160	1106 A-70TAG4	330	3900	1200	1900	2350
250	200	1206D-E70TTAG3	400	4000	1300	1900	2825
300	240	1506A-E88TAG5	400	5000	1700	2300	4010
400	320	2206 A-E13TAG3	400	5000	1700	2300	4010
500	400	2506D-E15TAG2	980	5400	1700	2300	4625
600	480	2806A-E18TAG1A	980	6100	2500	3000	9750
650	520	2806A-E18TAG2	980	6100	2500	3000	9750
750	600	4006D-23TAG2A	980	6900	2600	3760	9900
800	640	4006D-23TAG3A	980	6900	2600	3760	9939
1010	800	4008 A -30TAG1	External	8312	2600	3760	13340
1250	1000	4012-46TAG0A	External	9112	2600	3760	16456
1375	1100	4012-46TAG1A	External	9112	2600	3760	16800
1500	1200	4012-46TAG2A	External	9112	2600	3760	17354
1700	1360	4012-46TAG3A	External	9112	2600	3760	18150
1850	1480	4016-61TRG1	External	10363	3300	3950	23233
2000	1600	4016-61TRG2	External	10363	3300	3950	24033
2250	1800	4016-61TRG3	External	10363	3300	3950	25081

**Note:-** ♦ All Gensets are with Silent Acoustic-RTU Set (3 Phase /1 Phase) ♦ (Open Type Genset & External Fuel Tank available on request)  
 ♦ The above Dimensions may vary due to continuous Development & are subject to change without prior information  
 ♦ Genset supplied with Stamford / LS / Mecalte Alternator and Deep Sea / ComAp / DEIF Controller  
 ♦ Switchable Engines Available on request (1500 rpm to 1800 rpm)  
 ♦ All Gensets are covered with International Warranty

## Diesel Generator Set Product Ratings 3 Phase, 415 V, 50 Hz, 1500 RPM

### Maks Generators - High Performance Range (10 kVA To 125 kVA)

KVA	KW	Engine Brand	Engine Model	Alternator	Fuel Tank in Ltr	Canopy Dimensions in MM			Weight in KG
						Length	Width	Height	
10 KVA	8	Simpson	SC 213TAA	SOL1H1	100	1900	930	1400	1000
15 KVA	12	Simpson	SC 213TAA	SOL1P1	100	1900	930	1400	1000
20 KVA	16	Simpson	S 325	PT 144C	125	2400	1100	1630	1500
25 KVA	20	Simpson	S 325	PT 144C	240	2400	1100	1630	1500
30 KVA	24	TATA	497 TC77	SOL2P1	240	2400	1100	1630	1500
35 KVA	28	TATA	497 TC77	SIL2N1	240	2400	1100	1630	1500
40 KVA	32	TATA	497 TC76	SIL2N1	240	2600	1100	1750	1600
50 KVA	40	TATA	497 TC75	SIL2N1	240	2600	1100	1750	1600
62.5 KVA	50	TATA	497 TC74	SIL2Y1	240	2600	1100	1750	1600
75 KVA	60	TATA	697 TCS1	UCI224G	240	3300	1100	1900	1900
82.5 KVA	66	TATA	697 TCS1	UCI224G	300	3300	1100	1900	1900
100 KVA	80	TATA	697 TCS2	UCI274C	300	3300	1100	1900	1900
125 KVA	100	TATA	697 TCS2	UCI274E	300	3300	1100	1900	1900

- Note :-
- All Gensets are with Silent Acoustic ( Open Type Genset & External Fuel tank available on request)
  - All Generators are in ready to use condition (RTU Set)
  - All ratings are Prime rated Gensets with 230/415 ( 1 Phase / 3 Phase) options.
  - Genset Supplied with Stamford /LS/ Meccalte Alternator and Deep sea /ComAp / DEIF Controller
  - Switable Frequency Gensets are available on request ( 50 Hz/ 60 Hz)

### Manufacturers and Exporters of spares for :

#### AUTHORISED DISTRIBUTORS :





- ▶ **M. M. Diesel Spares**
- ▶ **MAKS Energy Solutions India Pvt. Ltd.**
- ▶ **MAKS International**

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**Note**

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- All manufacturers, names, logos, symbols, models, part numbers and descriptions are used only for reference purpose and should not be construed as the product of the manufacturers / suppliers.
- Specifications are subject to change without notice.

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