



Dependable **Energy**



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

Our Associates :



www.MAKSgenerators.com



A legacy of **more than three decades**

- ▶ **M. M. Diesel Spares (MMDS)** is a 35 years old business house primarily focusing on Manufacturing, Sales and Service of diesel generators and diesel engine spares across the globe.
- ▶ **MAKS Energy Solutions (India) Pvt. Ltd.** is the sister-concern of MMDS and is the youngest among the group companies.
- ▶ **With a turnover of USD 33 million** the group has over 30 percent market share in spare parts business in India. It caters to East Europe, North Europe, Middle East, Africa, North America and South America along with countries in Indian Subcontinent.
- ▶ **MMDS and MAKS Energy** are headquartered in **Pune** and have branch offices in New Delhi, Kolkata, Ranchi and Vapi & has a separate office for all its exports and sourcing requirements. MAKS also have spread its wings outside India with offices and factory unit in **Dubai and Shanghai.**
- ▶ **MMDS** has the largest sales and service network across India consisting over 300 dealers for generator sale and spares.
- ▶ **MMDS** is a registered supplier to the Indian Railways, Indian Air Force, various Indian Defence establishments, government, semi-government and private organisations.



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:

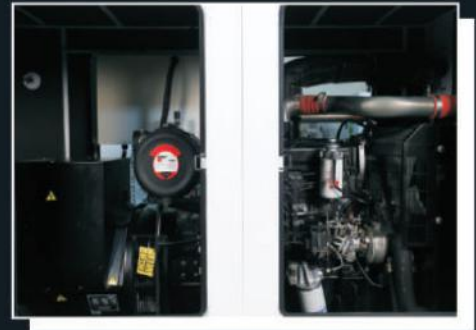
- ▶ Communication companies
- ▶ Construction sites
- ▶ Mining sites
- ▶ Data centres
- ▶ Government buildings
- ▶ Educational institutions
- ▶ Healthcare facilities
- ▶ Manufacturing, commercial and industrial facilities
- ▶ Residential complexes
- ▶ Malls, multiplexes and other entertainment complexes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

Generator Features Front View



2 mm Thickness
Acoustic Enclosure
Sound >75dBA @ 1 mtr.

Back View



At the heart of the generator

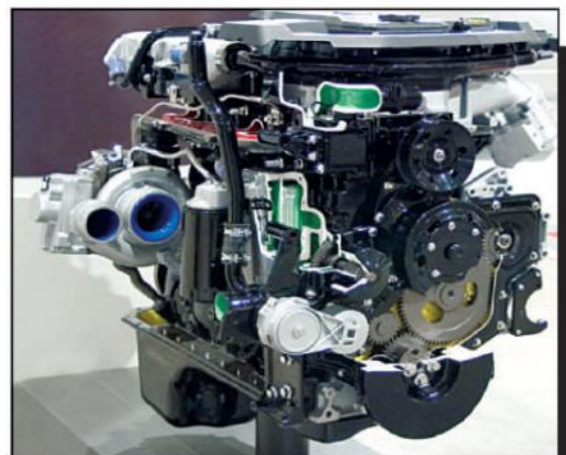
With world-class engine, alternator and control panel at its heart, the MAKS DG set is a reliable power generation source.

1. Genset Engines:

MAKS generators are powered by wide range of world-class engines with 2, 4, 6 and 12 cylinders. All engines comply with the latest CPCB emission norms and are environment-friendly.

Engine advantages:

- ▶ Compact size
- ▶ Easy maintenance
- ▶ Easy availability of spare parts
- ▶ Longer interval between overhauls
- ▶ Less wear and tear gives longer life to parts
- ▶ Low noise level
- ▶ Better fuel-efficiency



2. 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

3. 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

4. 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

Model	Net Engine Output		Typical Generating Set Output				1500 rpm switchable
	Prime	Standby	Prime		Standby		
	kWm	kWm	kWe	kVA	kWe	kVA	

1500 rev/min (6 kVA to 2500 kVA)

403D-07G *	5.4	6.0	4.7	5.8	5.1	6.4	
403A-11G1	8	9	7	9	8	10	
403A-15G1	12	13	10	13	11	15	
403A-15G2	14	15	12	15	13	17	†
404A-22G1	18	20	16	20	18	22	
404D-22TG	25	27	22	27	24	30	
1103A-33G	28	30	24	30	26	33	▪
1104C-44G1	38	54	35	44	38	48	
1103A-33TG1	42	46	36	45	40	50	▪
1104C-44TG2	54	59	48	60	53	67	▪
1103A-33TG2	55	61	48	60	53	66	▪
1104A-44TG1	58	64	52	65	57	72	▪
1104A-44TG2	72	79	64	80	70	88	▪
1104C-44TAG1	72	79	64	80	71	89	▪
1104C-44TAG2	90	100	81	101	90	112	▪
1106A-70TG1	119	132	108	135	120	150	
1106A-70TAG2	131	144	120	150	132	165	
1106A-70TAG3	158	175	144	180	160	200	
1106A-70TAG4	174	191	160	200	176	220	
1506A-E88TAG1*	184	202	160	200		220	▪
1506A-E88TAG2*	205	228	184	230		250	▪
1506A-E88TAG3*	228	250	200	250		275	▪
1506A-E88TAG4	250	273	220	275		300	▪
1506A-E88TAG5	273	299	240	300	264	330	▪
2206A-E13TAG2	305	349	280	350	320	400	▪
2206C-E13TAG2	305	349	280	350	320	400	▪
2206A-E13TAG3	349	382	320	400	360	450	▪
2206C-E13TAG3	349	392	320	400	360	450	▪
2506A-E15TAG1	396	434	364	455	400	500	▪
2506C-E15TAG1	396	434	364	455	400	500	▪
2506A-E15TAG2	435	478	400	500	440	550	▪
2506C-E15TAG2	435	478	400	500	440	550	▪
2806C-E18TAG1A	514	565	473	591	520	650	▪
2806A-E18TAG1A	522	574	480	600	528	660	▪
2806A-E18TAG2	565	609	520	650	560	700	▪
4006-23TAG2A	628	691	600	750	660	825	▪
4006-23TAG3A	675	756	640	800	720	900	
4008TAG1A	767	844	720	900	800	1000	
4008TAG2A	861	947	800	1000	880	1100	▪
4012-46TAG0A	1053	1158	1000	1250	1100	1375	
4012-46TWG2A	1055	1166	1000	1250	1100	1385	▪
4012-46TAG1A	1148	1263	1100	1350	1200	1500	
4012-46TWG3A	1149	1263	1100	1350	1200	1500	
4012-46TWG4A	1254	1342	1200	1500	1280	1600	
4012-46TAG2A	1267	1395	1200	1500	1320	1650	▪
4012-46TAG3A	1440	1583	1350	1710	1500	1875	
4016TAG1A	1537	1690	1480	1850	1600	2000	
4016-61TRG1	1558	1684	1480	1850	1600	2000	
4016-61TRG2	1684	1895	1600	2000	1800	2250	
4016TAG2A	1715	1886	1600	2000	1800	2250	
4016-61TRG3	1875	2083	1800	2250	2000	2500	

Technical Data



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

Genset Model	Prime Rating		Engine Model	BHP	Alternator Frame	Genset Controller
	kVA	kW				
C15D5P	15	12	X1.3TAAG1	14.2	PT144D	PS0500
C20D5P	20	16	X2.7T-G1	32	PT144C	PS0500
C25D5P	25	20	X2.7TAA-G2	32	Pt144E	PS0500
C30D5P	30	24	X2.7TAA-G3	38	PT144L	PS0500
C35D5P	35	28	X3.6TAA-G1	45	PT144M	PS0500
C40D5P	40	32	X3.6TAA-G2	51	PT144J	PS0500
C50D5P	50	40	4B3.3TAA-G11	66	UC1224D	PS0500
C62.5D5P	62.5	50	4B3.3TAA-G11	84	UC1224V	PS0500
C70D5P	70	56	4BTAA3.9-G3	91	UC1224F	PS0500
C82.5D5P	82.5	66	4BTAA3.9-G4	110	UC1224G	PS0500
C100D5P	100	80	6BTAA5.9-G13	124	UC1274C	PS0500
C125D5P	125	100	6BTAA5.9-G13	159	UCI274V	PS0500
C140D5P	140	112	QSB5.9-G1	184	UCI274E	PC1.1
C160D5P	160	128	QSB5.9-G2	206	UCI274F	PC1.1
C180D5P	180	144	QSB6.7-G11	234	UCI274G	PC1.2
C200D5P	200	160	QSB6.7-G12	256	UCI274H	PC1.2
C250D5P	250	200	QSL9-G16	315	UCI274K	PC1.2
C300D5P	300	240	QSL9-G15	363	HCI444D	PC1.2
C365D5P	365	292	QSN14-G1	448	HCI444F	PC1.2
C400D5P	400	320	QSN14-G2	487	HCI544C	PC1.2
C500D5P	500	400	KTAA19-G10	587	HCI544D	PC1.2
C600D5P	600	480	QSK19-G6	708	HCI544E	PC1.2
C640D5P	640	512	QSK19-G7	751	HCI544F	PC1.2
C750D5P	750	600	KTA38-G10	894	HCI634W	PC3.3
C810D5P	810	650	KTA38-G11	963	HCI634V	PC3.3
C1010D5P	1010	808	KTA38-G5	1180	HCI634Y	PC3.3
C1250D5P	1250	1000	KTA50-G3	1470	HCI634Z	PC3.3
C1500D5P	1500	1200	KTA50-G8-I	1735	P1734C	PC3.3
C1875D5P	1875	1500	QSK60-G3	2165	P1734E	PCC3201
C2000D5P	2000	1600	QSK60-G4	2319	P1734F	PCC3201
C2250D5P	2250	1800	QSK60-G8	2603	P1734G	PCC3201
C2750D5P	2750	2200	QSK78-G9	3088	LVS1804T	PC3.3

Prime Power (PRP) : Applicable for supplying power to varying electrical load for unlimited hours. Prime Power (PRP) is in accordance with ISO 8528



MAKS International

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

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Cell : + 91 7350000095

Nigeria Office : (Authorised Cummins OEM)

Relion Power Industries Ltd., Victoria Island, Lagos, Nigeria.

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Plant II

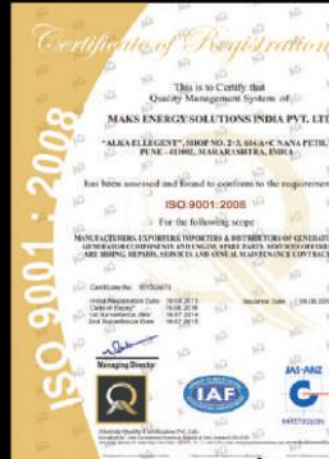
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