

MC | 410 | -L | 328 KW
INDUSTRIAL DIESEL GENERATOR SET



Prime Power Rating*

410 kVA | 328 KW | 50 Hz

Standby Power Rating

451 kVA | 361 KW | 50 Hz

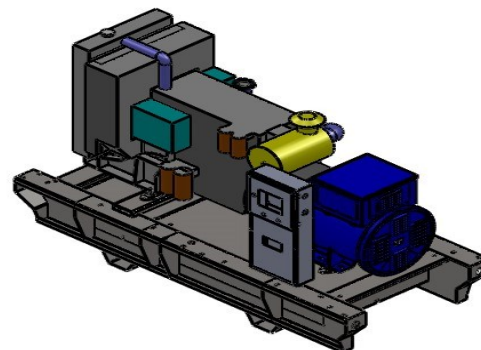
Prime Power Rating*

NA kVA | NA KW | 60 Hz

Standby Power Rating

NA kVA | NA KW | 60 Hz

Voltage is 230/400 V, @ 0.8 pf for all ratings



Codes and Standards

METS Energy products are designed to the following standards:



ISO 3046, 7637, 8528, 9001

Electrical Generating Systems
Association

Powering Ahead

Since 1987, METS Energy specialized in the manufacturing, sales and rental of power generating sets, has been generating and providing power solutions to partnering clients in more than forty countries in the construction, industrial, residential and telecom sectors.

METS Energy is also a provider of Sound Proof Canopies, Electrical Panels, Synchronizing Systems, and Spare Parts.

METS Energy has differentiated itself from the various players in the industry with lasting and mutually beneficial relationships built on trust, service, and care with both suppliers and clients.

METS Energy will continue to conduct its business and extend its market boundaries with the highest standards of quality, ethics, and integrity to let customer proud, secure, and satisfied by providing dynamic products and services that meet customer needs.

***Prime power:**

Variable load. Unlimited hours usage with an average load factor of 80% of the published prime power over 24 hours period. A 10% overload is available for 1 hour in every 12 hours operation

Baseload power:

Unlimited hours usage with an average load factor of 100% of the published Baseload rating. A 10% overload is available for 1 hour in every 12 hours of operation.

Standby power:

The power limited to 500 hours annual usage with an average load factor of 80% of the published standby power rating over each 24-hour period. Up to 300 hours of annual usage may be run continuously. No overload is permitted on standby power.

STANDARD FEATURES

ENGINE SYSTEM

- Oil Drain Extension
- Air Cleaner
- Fan Guard
- Stainless Steel Flexible Connection
- Factory Filled Oil
- Exhaust Silencer (SPC)
- Industrial Exhaust Silencer (Open Set)

ALTERNATOR SYSTEM (A/C)

- Class H Insulation Material
- Vented Rotor
- 2/3 Pitch
- Skewed Stator
- Auxiliary Voltage Regulator Power Winding
- Sealed Bearing
- Rotor Dynamically Spin Balanced
- Amortisseur Winding
- Full Load Capacity Alternator

GENERATOR SET & ENCLOSURE (if selected)

- Insulated Exhaust Piping
- Internal Genset Vibration Isolation
- Separation of Circuits - High/Low Voltage
- Main Line Circuit Breaker
- Battery Cables and tray
- Rust-Proof with Nylon Washers
- Sound-Absorbing Material (L1 & L2)
- Gasketed Doors
- Stainless Steel Lift Off Door Hinges (For SM)
- Stainless Steel Lockable Handles (For SM)

TANK & FUEL SYSTEM

- Flexible Fuel Lines
- Primary Fuel Filter
- Air Outlets Vent
- Drain Valves
- Protected Level Gauge
- Primary paint protection against corrosions

COOLING SYSTEM

- Factory-Installed Radiator
- Factory Antifreeze filling
- Closed Coolant Recovery System
- Radiator Drain Extension
- Antifreeze Ready Mix -25°C

CONTROL SYSTEM

- 21-Light Remote Annunciator
- Remote Relay Panel (8 or 16)
- 10A Run Relay
- Remote Emergency Stop (Surface Mount)
- Remote Communication-Modem/Ethernet
- Oil Temperature Sender & Indication Alarm

ENGINEERED OPTIONS

ENGINE SYSTEM

- Oil Make-Up System
- Oil Heater
- Coolant Heater Ball Valves
- Industrial Exhaust Silencer (Open Set)
- Jacket Water Heater
- Fuel Water Separator

ALTERNATOR SYSTEM

- Alternator Upsizing
- Tropical Coating
- Anti Condensation Heater

CONTROL SYSTEM

- Battery Disconnect Switch
- Spare Inputs (x4)/Outputs (x4) - H Panel On

ELECTRICAL SYSTEM

- Battery Charging A/C Alternator
- Rubber Engine Electrical Connections
- Solenoid Activated Starter Motor
- 10A UL Battery Charger
- 2.5A Battery Charger
- Battery Warmer

TANKS

- Horizontal Cylindrical or Cubical type
 - Single/Double Wall Fuel Tanks
- Ground Support Base Frame
 - Electric Fuel Level
 - Mechanical Fuel Level
 - Extended vent system

CIRCUIT BREAKER OPTIONS

- Shunt Trip and Auxiliary Contact
- Electronic Trip Breakers

ENCLOSURE

- SSW- Super Silent Welded
- SW- Silent Welded
- SM- Silent Modular
- Sand Proof Enclosure
- Weather Proof

GENERATOR SET

- METS Remote Monitoring Software
- Extended Factory Testing
- Vibration Test
- Warranty and Maintenance Program
- Special Testing

FEATURES

- Motorized Dampers
- Door Switch for Intrusion Alarm
- Enclosure Ambient Heaters

CONTROL SYSTEM

Type	
Deep Sea	
6110 MKIII	
	
1. Indications • Operating Hours • 3 Phase Generator Voltage Sensing & Monitoring • Current Protection & Monitoring • Power Measurement (kW, kVA, kVAR, kWh, kVAh, kVARh, pf) • Frequency Monitoring (Hz) • Oil Pressure • Coolant Temperature/Fuel Level • Battery Voltage Monitoring • Alarm Acknowledge • All Phase AC Voltage-current • Date/Time Fault History (Event Log) • Alarm Information Automatically Comes Up On the Display	2. Warning & Shutdown Alarms • Generator Over/Under Voltage & Frequency • Crank Disconnect (Failure to Start) • Under/Over Speed • Over Current • Low oil pressure • High Water Temperature • Low Fuel Level • Low Water Level • Engine Speed (Pre-Programmed Over Speed Shut- down) • Battery Voltage Warning • Alarms & Warnings Time and Date • Alarms & Warnings for Transient and Steady State Conditions
4. Control • Auto/Start/Stop Control • Emergency Stop Pushbutton/Alarm Acknowledge • Engine Cool Down Timer • Warm-up Timer • Load Switching Timer • Engine Cycle Crank • USB connectivity and fully configurable via PC software	3.Features • 132 x 64 pixel LCD display • Configurable display languages • Five-key menu navigation • Durable soft touch membrane buttons • Easy access diagnostic page • Waterproof/Sealed Connectors • Audible Alarms and Shutdowns • Auto/Off/Manual Switch • Set maintenance periods can be configured

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APPLICATION AND ENGINEERING DATA

GENERAL

Manufacturer	Cummins
Engine Model	QSG12G2
Cylinder #/ Type	6 In-Line
Displacement - L	11.8
Bore - mm (in)	132 5.20
Stroke - mm (in)	144 6
Compression Ratio	NA
Aspiration	Turbocharged

ENGINE		Prime-50 Hz	Prime-60 Hz
Engine Speed	rpm	1500	1800
Horsepower	hp	439.9	NA
Piston Speed	m/s	7.2	8.6
Exhaust Flow	m3/min	NA	NA
Combustion Air	m3/min	NA	NA

FUEL CONSUMPTION

Percent Load	Prime- 50Hz		Prime- 60Hz	
	L/h	g/kwh	L/h	g/kwh
100%	78.3	187.9	NA	NA
75%	57	183.3	NA	NA
50%	39.2	187.9	NA	NA

Technical data operating on a fuel with density of 0.89 Kg/Liter

COOLING SYSTEM		Prime- 50Hz	Prime- 60Hz
Coolant Flow	(l/min)	NA	NA
Heat Rejection to Coolant	(KW)	NA	NA
Inlet Air	(m3/sec)	11.8	NA
Cooling System Type	Closed Recovery		
Max. Operating Radiator Air Temp	(°C)	55.0	
Coolant Capacity	(l)	48.0	

ALTERNATOR SPECIFICATIONS

Manufacturer	TAL
Alternator Model	TAL047A
Poles	4
Insulation Class - Rotor	H
Protection	IP 23

ELECTRICAL SYSTEM

System Voltage (V)	24 V
Ground Polarity	Negative
Battery Size & Qty	2*150Ah
Battery Voltage (V)	24 V
Battery Charger Alternator	Std

FUEL SYSTEM

Fuel Type	Diesel
Fuel Specifications	ASTM
Fuel Filtering	5 (microns)
Total Fuel Pump Flow (l/hr)	NA

Oil Pump Type	Gear
Oil pan Capacity (L)	34.1
Recommended Lube Oil	15W40 API CH4/ CI4
Maximum Lube Oil Temperature-°C	110

Backpressure (kpa)	NA
Exhaust Gas Temp°C	NA
Exhaust Outlet Size (in)	6
Governor	Electronic

Standard Excitation	Brushless with auxiliary coil
Bearings	Single Sealed Cartridge
Coupling	Direct, Flexible Disc
Voltage Regulator	Analog/ Digital
Harmonic Distortion	<5% Telephone Interference Factor

PRIME POWER RATINGS (3 phase 240/300 volt-0.8 pf)

Prime-50 Hz	
Three-Phase 230/400 VAC @0.8pf	328 KW
Prime-60 Hz	
Three-Phase 230/400 VAC @0.8pf	NA KW

For single phase ratings, please refer to Engineering team.

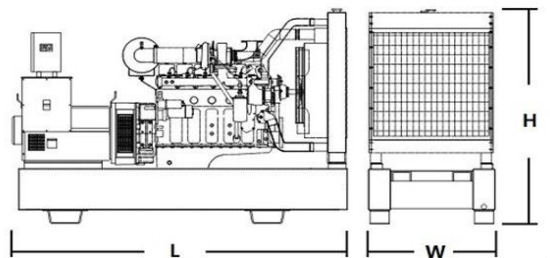
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DIMENSIONS AND WEIGHTS*

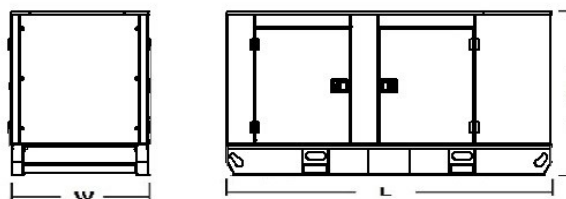
OPEN SET

L x W x H				Weight	
3310	1550	2047.5	mm	2568.1	Kg
130.3	61.0	80.6	in	5661.7	lbs



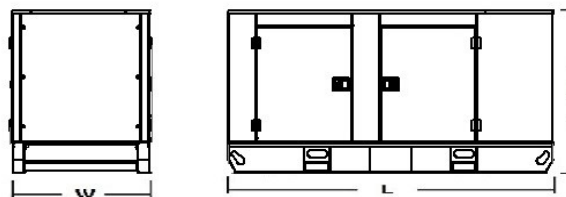
MC | 410 | -L /SSW (70dB(A) @1m)

L x W x H				Weight	
7000	2200	3700	mm	6268.1	Kg
275.6	86.6	145.7	in	13818.8	lbs



MC | 410 | -L /SM (82 dB(A) @1m)

L x W x H				Weight	
5800	2000	2500	mm	4368.1	Kg
228.3	78.7	98.4	in	9630.0	lbs



* All measurements are approximate and for estimation purposes only.

Sound level is measured in db(A) at open space and full load.

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