

## Model: MS 1650D5

Powered by Shanghai MHI Engine



### Generator Specification

Service	PRP <sup>(1)</sup>	ESP <sup>(2)</sup>
Power (kVA)	1500	1650
Power (kW)	1200	1320
Rated speed ( r.p.m)	1500	
Standard voltage (V)	400/230V	
Rated at power factor(cos phi)	0.8	



AGG Power gensets are compliant with ISO 9001 and CE standard, which include the following directives:

- 2006/42/EC Machinery safety.
- 2006/95/EC Low voltage
- EN 60204-1: 2006+A1: 2009, EN ISO 12100: 2010, EN ISO 13849-1: 2008, EN 12601 : 2010

#### (1) PRP (Prime Power):

According to ISO8528-1, prime power is the maximum power available during a variable power sequence, which may be run for an unlimited number of hours per year, between stated maintenance intervals. The permissible average power output during at 24 hours period shall not exceed 80% of the prime power. 10% overload available for governing purposes only.

#### (2) ESP (Standby Power):

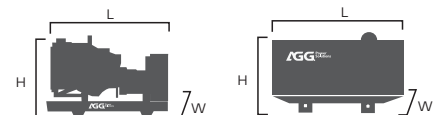
According to ISO 8528-1, It is defined as the maximum power available, under the agreed operating conditions, for which the generating set is capable of delivering for up to 500 hours of operation per year (of which no more than 300 hours for continuative use) with the maintenance intervals and procedures being carried out as prescribed by the manufacturers. No overload capability is available.

Powers Voltage (V)	ESP		PRP		Standby Amps
	KVA	KW	KVA	KW	
415/240	1650	1320	1500	1200	2295.6
400/230	1650	1320	1500	1200	2381.6
380/220	1650	1320	1500	1200	2507.0

Performance Data		
Model	MS1650D5	
Engine brand	Shanghai MHI Engine	
Engine model	S12R-PTAA2-C	
Speed control type	Electronic	
Phase	3	
Control system	Digital	
Starter motor voltage	24V	
Frequency	50HZ	
Engine speed (RPM)	1500	
Fuel Consumption (L/H)	100% standby power	341
	100% prime power	308
	75% prime power	231
	50% prime power	162

#### Standard reference Conditions

Note: Standard reference condition 25°C (77°F) air inlet temp, 100m(328ft) A.S.L 30% relative humidity. Fuel consumption dat with diesel fuel with specific gravity of 0.85 and conforming to BS 2869: 1998 , Class A2



Dimension and Weight		
Dimension	Open	Silent
Length (L)	5015mm	6058mm
Width (W)	2205mm	2438mm
Height (H)	2545mm	2896mm
Net Weight	-	-
Fuel Tank (L)	Option	Option

## ■ Engine Specification: S12R-PTAA2-C

Basic technical data	
No. of cylinders	12
Cylinder arrangement	V
Cycle	4 stroke
Induction system	Turbocharged with inter cooler
Compression ratio	13.5:1
Bore	170mm
Stroke	180mm
Displacement	49.3L
Firing order	1-12-5-8-3-10-6-7-2-11-4-9
Approximate engine weight	5520kg

Cooling system	
Capacity coolant	
Engine	125L
Radiator	182L
Piping	10L
Total	317L
Water pump	Gear drive centrifugal type
Capacity of water pump	1650 L/min
Thermostat	Wax pellet type x 2pcs Open at 71-85 °C
Fan	Pusher type
Radiation area	
Inter cooler inside	168.9cm <sup>2</sup>
Radiator side	463.1m <sup>2</sup>

Fuel system	
Fuel inlet pipings	Flexible hose (Rc 3/4 joint)
Fuel return pipings	Flexible hose (Rc 3/4 joint)
Injection pump	Bosch type "PS6A" without timer
Feed pump	Piston type with priming pump
Injection Nozzle	Hole type O.31mm x 10 holes
Fuel filter	Paper element cartridge type

Air intake system	
Air cleaner	Donaldson EGB 20 x 2 pcs
Turbocharger	Mitsubishi type TD and TF type
Air cooler	Air cooled type
Air heater	Not supply

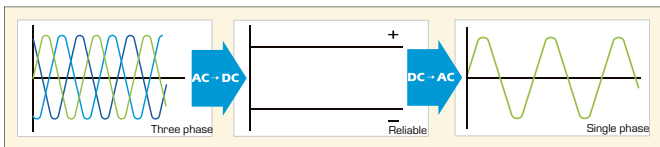
Lubrication system	
Oil pump	Gear pump type
Capacity of oil pump	480L/min
Lub. oil pressure at main gallery	0.5-0.65Mpa
Quantity of oil	
Oil pan full level	150L
Low level	110L
Others	30L
Total	180L
Lub. oil filter (full flow)	20 μ
Lub oil filter (By-pass flow)	2 μ
Lub oil cooler	Water cooled corrugated type

Control system	
Governor	Electronic speed governor
Actuator	DC24
Controller	XS-400B-03
Potentiometer	Not supply
Potentiometer	Not supply
Connector	Loose supply
Magnetic pick up	With connector
Cable	Loose supply

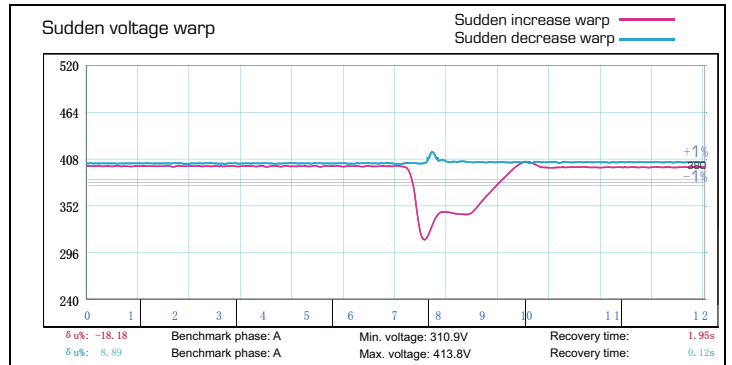
Starting system	Prime power
Starter switch	With key , with heat position
Starting motor	DC24V, 7.5KW x 2 pcs
Safety relay	Loose supply
Current of starter	Rush 1250A Cranking 400A
Alternator	With voltage regulator
Recommended battery capacity	DC24V, 250AH

## ■ Alternator Specification

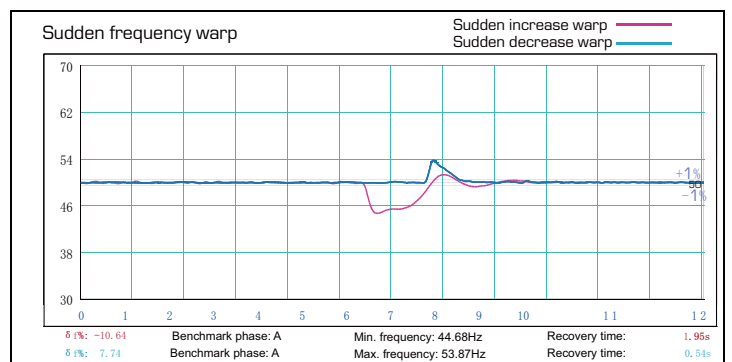
Alternator	
Number of phase	3
Power factor (Cos Phi)	0.8
Poles	4
Winding Connections (standard)	Star-serie
Terminals	12
Insulation type	H class
Winding Pitch	2/3
IP rating	IP23
Excitation system	Self-excited
Bearing	Single bearing
Coating	Vacuum impregnation
Voltage regulator	A.V.R
Couping	Flexible disc



Emergency voltage curve



Emergency frequency curve



## ■ Options

Engine	Alternator	Generator Sets	Fuel System
<ul style="list-style-type: none"> <li>Water Jacket Pre-heater</li> <li>Fuel heater</li> </ul>	<ul style="list-style-type: none"> <li>Winding Temp measuring Instrument</li> <li>Alternator Pre-heater</li> <li>PMG</li> <li>Anti-damp and anti-corrosion treatment</li> <li>Anti-condensation heater</li> <li>Winding and bearing RTD</li> </ul>	<ul style="list-style-type: none"> <li>Tools with the machine</li> <li>Extended range fuel tank</li> <li>Bunded fuel tank</li> </ul>	<ul style="list-style-type: none"> <li>Low fuel level alarm</li> <li>Automatic fuel feeding system</li> <li>Fuel T-valves</li> </ul>
Canopy	Lub oil system	Cooling System	Control Panel
<ul style="list-style-type: none"> <li>Rental type Canopy</li> <li>Trailer</li> </ul>	<ul style="list-style-type: none"> <li>Oil Pre-heater</li> <li>Oil temp sensor</li> </ul>	<ul style="list-style-type: none"> <li>Front heat protection</li> </ul>	<ul style="list-style-type: none"> <li>Remote control panel</li> <li>ATS</li> <li>Synchronizing controller</li> <li>Adjustable earth leakage relay</li> </ul>

## ■ Control Panel

### Configuration

- Emergency stop button
- Protection MCB
- Battery charger
- Integrated aviation plug
- ATS connection
- Digital control module

### Features

- 3 phase generator set monitoring
- Support of engines equipped with electronic control unit
- Comprehensive diagnostic message
- Automatic or manual start/stop of the gensets
- Push buttons for simple control, lamp test
- Graphic back-lit LCD display
- Parameters adjustable via keyboard or PC
- Mains measurements ( 50HZ/60HZ)
- Generator measurements ( 50HZ/60HZ)
- Comprehensive shutdown or warning on fault condition
- 3 phase Generator protections
  - Over-/under voltage
  - Over-/under frequency
  - Current/voltage asymmetry
  - Over current/overload
- 3 phase AMF function
  - Over-/under frequency
  - Over-/under voltage
  - Voltage asymmetry
- Configurable analog inputs
- Battery voltage, engine speed (pick-up) measurement
- Configurable programmable binary inputs and outputs
- Warm-up and cooling functions
- Generator C.B. and Mains C.B. control with feedback and return timer
- RS232 interface
- Modem communication support
- Hours counter
- Sealed to Ip65
- Event log

### Benefits

- Less wiring and components
- Integrated solution
- Less engineering and programming
- User friendly set-up and button layout
- Module can be configured to suit individual applications
- PC software for simplified configuration
- Wide range of communication capabilities

### Operation conditions

- Operation temp: -20 °C to + 70 °C
- Storage temp: -30 °C to + 80 °C
- Operating humidity: 95% w/o condensation
- Vibration : 5-25Hz, ±1.6 mm  
5-100Hz, a=4g
- Shocks: a= 500m/s<sup>2</sup>

### Options

- Ethernet interface (Remote monitoring and control)
- GSM modem/wireless internet (Remote monitoring and control)
- RS232-RS485 Dual port interface
- Synchronizing control panel
- Distribution board with sockets kit and power busbar
- Battery trickle charge ammeter
- Earth leakage protection
- Earth fault protection
- Low fuel level alarm
- Low fuel level shutdown
- High fuel level alarm
- Fuel transfer system control
- Low coolant level shutdown
- High lube oil temp shutdown
- Overload via alarm switch on breaker
- Engine coolant heater controls
- Control panel heater
- Speed adjust switch
- Oil temp displayed on LCD screen
- Additional 8 inputs and outputs