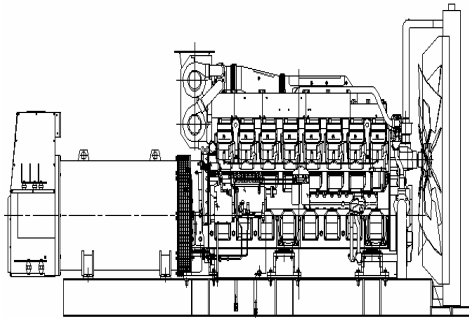




MAQUINARIA IGSA POWER GENERATION SYSTEMS



MODEL: GSMT11600M
DIESEL ENGINE: MITSUBISHI
MODEL: S16R-Y1PTA-2, TIER 1
CAPACITY: 1600 kW; 1800 RPM

RATINGS RANGE	
PRIME hp (kW) 2133 (1591)	STANDBY hp (kW) 2346 (1750)

All data represent net performance with Standard accessories such as air cleaner, inlet/exhaust manifolds, fuel oil system L.O. pump, etc. under the condition of 100kPa (14.5 psi) barometric pressure, 77°F (25°C) Ambient temperature and 30% relative humidity

STANDARD FEATURES

Complete system designed and built at ISO9001 certified facility

- Factory tested to design specifications at full load conditions.
- Fully engineered with a range of options and accessories.

1 IGSA Genset's are composed of 16 cylinders in V, and four strokes diesel engine for industrial stationary applications. Those equipments are fully factory tested using a resistive load. (1) Hour ramp 100% load test.

2 The controls and accessories are selected to work together to achieve the maximum operational performance and security.

3 Exhaust gases silencer, and a section of flexible tube for connection purposes.

4 Engine MITSUBISHI, **S16R-Y1PTA-2 TIER 1**

5 Marathon Alternator.

6 Radiator.

7 Control MEC 310 (panel USC300).

8 Base of structural steel.

GENERAL FEATURES

- IGSA GENSET of, **1600 kW to 480V, 440V, 416V, 380V, 220V, 208VAC**, 3 Phase, 4 Wire, 60 Hertz, is composed by an internal engine four strokes coupling with the alternator, controls and accessories totally assembled and tested in factory. For special voltages ask to manufacturer.
- The controls and accessories of the Genset are selected to provide the maximum in efficiency and Security.
- The generator set its components are tested factory-built, and production-tested.
- The genset engine is certified by the Environmental Protection Agency (EPA) to conform to Tier 1 nonroad emissions regulations.
- Speed control Woodward ProAct



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ENGINE SPECIFICATION DATA MODEL S16R-Y1PTA-2

Weight 6200 Kg (13671 Lb)

General Data		Lubrication System	
Model	S16R-Y1PTA-2	Oil Pressure at Idle--psi (kgf/cm ²)	29~43 (2~3)
Cylinder Arrangement	60°V	at Rate Speed--psi (kgf/cm ²)	71~93 (5~6.5)
Number of Cilindres	16	Maximum Oil Temperature--°F (°C)	230 (110)
Bore and Stroke--in.(mm)	6.69x7.09 (170x180)	Oil Capacity of Standard Pan High--Gal (Liter)	52.8 (200)
Displacement--in. ³ (L)	3989 (65.37)	Low--Gal (Liter)	37.0 (140)
Compression Ratio	15.0:1	Total System Capacity (Includes Oil Filter)--Gal (Liter)	60.80 (230)
Engine Type	4 Cycle, Water Cooler	Maximum Angle of Installation (Std. Pan) Front Down	5°
Aspiration	Turbo-Charged, After Cooler	(Engine Only) Front Up	5°
Physical Data		Side to Side	22.5°
Length--in.(mm)		Cooling System	
Width--in.(mm)		Coolant Capacity (Engine only)-- Gal (Liter)	49.9 (170)
Height--in.(mm)		Maximum External Friction Head at Engine Outlet--psi (kgf/cm ²)	5.0 (0.35)
Weight, dry--lb (kg)	13671 (6200)	Maximum Static Head of Coolant above Crankshaft Center-- m(ft)	32.8 (10)
Weight, wet--lb (kg)	14502 (6577)	Maximum Outlet Pressure of Engine Water Pump--psi (kgf/cm ²)	28.6 (2)
Performance Data		Standard Thermostat (modulating) Range-- °F (°C)	160~185 (71~85)
Steady State Speed Stability Band any Constant Load Electric Governor-- %	±0.25 or better	Maximum Coolant Temperature at Engine Outlet--°F (°C)	208 (98)
Maximum Overspeed Stability Capacity-- rpm	2100	Maximum Coolant Expansion Space-- % of System Capacity	10
Moment of inertia of Rotating Components-- lbf X ft ² (kgf x m ²)	1918 (80.83)	Maximum Coolant Temperature at Intercooler Inlet, TK type--°F (°C)	
(includes Std. Flywheel)		Maximum Air Restriction on Discharge Side of Radiator and Fan-- in.H2O (mm.H2O)	0.4 (10)
Cyclic Speed Variation with Flywheel at 1800rpm	1/283	Fuel System	
Engine Mounting		Fuel Injection	Mitsubishi PS8 x2
Maximum Bending Moment at Rear Face of Flywheel Housing--lbf X ft (kgf x m)	3256 (450)	Fuel Consumption – ST-BY (PRIME)	
Air System		Load 75% gal/h	85.9 (78.5)
Maximum Air Intake Restriction (Includes piping)		Load 100% gal/h	115.7 (104.3)
With Clean Filter Element-- in.H2O (mm.H2O)	15.7 (400)	Starting System	
With Dirty Filter Element-- in.H2O (mm.H2O)	25.0 (635)	Battery Charging Alternator-- Ah-V	24 – 30
Exhaust System		Starting Motor Capacity-- kW - V	24-7.5 x 2
Max. Allow. Back Press.--in.H2O (mm.H2O)	23.6 (600)	Maximum Allowable Resistance of Cranking Circuit-- m Ω	1.5
		Recommended Minimum Battery Capacity	
		At 5°C (41°F) and above-- Ah	300
		Bellow 5°C (41°C) throught--23°F (5°C)	600



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MARATHON ELEC. ALTERNATOR MODEL 743RSL4052

Weight 3536.5 Kg (7800Lb)

Kilowatt ratings kW (kVA)	1800 RPM			60 Hertz			4 Bus Bars		
	3 Phase			0.8 Power Factor			Dripproof or Open Enclosure		
Voltage	Class B		Class F				Class H		
	80° C, 176°F (1) Continuous	90° C, 194°F (1) Lloyds	95° C, 203°F (1) ABS	105° C 221°F British † Standard	105° C, 221°F (1) Continuous	130° C, 266°F (1) Standby	125° C 257°F British † Standard	125° C, 257°F (1) Continuous	150° C, 302°F (1) Standby
480	1310(1638)	1440(1800)	1500(1875)	1600(2000)	1600(2000)	1750(2188)	1600(2000)	1700(2125)	1750(2188)
460	1350(1688)	1490(1863)	1480(1850)	1640(2050)	1640(2050)	1710(2138)	1640(2050)	1710(2138)	1710(2138)
440	1420(1775)	1540(1925)	1430(1788)	1680(2100)	1680(2100)	1710(2138)	1680(2100)	1710(2138)	1710(2138)
416	1400(1750)	1480(1850)	1400(1750)	1610(2013)	1610(2013)	1610(2013)	1610(2013)	1610(2013)	1620(2025)
380	1290(1613)	1370(1713)	1300(1625)	1480(1850)	1480(1850)	1480(1850)	1480(1850)	1480(1850)	1480(1850)

(1) Rise by resistance method, Mil-Std-705, Method 680.1b.

Rating per BS 5000.

Submittal Data: 480 Volts, 1750.4 kw, 2188 kVA, 0.8 P.F., 1800 RPM, 60 Hz, 3 Phase					
Mil-Std-705B			Mil-Std-705b		
Method	Description	Value	Method	Description	Value
301.1b	Insulation Resistance	> 1.5 Meg	505.3b	Overspeed	2250 RPM
302.1a	High Potential Test		507.1c	Phase Sequence CCW-ODE	ABC
	Main Stator	2000 Volts	508.1c	Voltage Balance, L-L or L-N	0.2%
	Main Rotor	1500 Volts	601.4a	L-L Harmonic Maximum - Total (Distortion Factor)	5.0%
	Exciter Stator	1500 Volts	601.4a	L-L Harmonic Maximum - Single	3.0%
	Exciter Rotor	1500 Volts	601.1c	Deviation Factor	5.0%
401.1a	PMG Stator	1500 Volts	--	TIF (1960 Weightings)	<50
	Stator Resistance, Line to Line High Wye Connection	0.0018 Ohms	--	thf (IEC, BS & NEMA EIGHTINGS)	< 2 %
	Rotor Resistance	0.979 Ohms	652.1a	shaft current	<0.1 ma
	Exciter Stator	22 Ohms	--	Main Stator Capacitance to Ground	0.07 mfd
	Exciter Rotor	0.043 Ohms	Additional Prototype Data		
	PMG Stator	2.1 Ohms	--	generator Frame	743
410.1a	No Load Exciter Field Amps at 480 Volts Line to Line	0.88 A DC	--	Type	MAGNAMAXDVR
420.1a	Short Circuit Ratio	0.685	--	Insulation	Class H
421.1a	Xd Synchronous Reactance	2.02 pu	--	Coupling	Flexible
422.1a	X2 Negative Sequence Reactance	0.185 pu	--	Amortisseur Windings	Full
423.1a	X0 Zero Sequence Reactance	0.06 pu	--	Excitation	Ext. voltage Regulate, Brushless
425.1a	X'd Transient Reactance	0.135 pu	--	Voltage Regulator	DVR2000
426.1a	X''d Subtransient Reactance	0.112 pu	--	Voltage Regulation	0.25%
--	Xq quadrature Synch React.	1.0 pu	--	Cooling Air Volume	3260 CFM
427.1a	T'd Transient Short Circuit Time Constant	0.157 sec.	--	Heat rejection rate	4661 Btu's/min
428.1a	T''d Subtransient Short Circuit Time Constant	0.01 sec.	--	Full load rate current	2632 amps
430.1a	T'do Transient Open Circuit Time Constant	2.95 sec.	--	Minimum Input hp required	2456.2
432.1a	Ta Short Circuit Time Constant of Armature Winding	0.028 sec.	--	Efficiency at rated load	95.5%
			--	Full load torque	7164 Lb-ft

RATINGS: All three-phase units are rated at 0.8 power factor. All single-phase units are rated at 1.0 power factor. Standby Ratings: Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. There is no overload capability for this rating. Ratings are in accordance with ISO-3046/1, BS5514, AS2789, and DIN 6271. Prime Power Ratings: Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for a 12 hour period. Ratings are in accordance with ISO-8528/1, overload power in accordance with ISO-3046/1, BS 5514, AS 2789, and DIN 6271. For limited running time and base load ratings, consult the factory. The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. GENERAL GUIDELINES FOR DERATION: Altitude: Derate 1.0% per 100 m (328 ft.) elevation above 1500 m (4921 ft.). Temperature: Derate 4.0% per 10°C (18°F) temperature above 40°C (104°F).



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CONTROLLER FOR GENSET: CONTROL MEC 310 PANEL USC300

The Generator Controller MEC 310 is a microprocessor-based control unit containing all necessary functions for protection and control of a power generator. Besides the control and protection of the diesel engine it contains a full 3-phase AC voltage and current measuring circuit. The unit is equipped with an LCD display presenting all values and alarms.



- USC 300C Unit Mount Control Panel, Black Nema 1 enclosure c/w rubber mounts
- MEC 310 Microprocessor Based Engine Generator Controller
- Graphic Display 128 X 64 pixels (STN) Super Twisted Nematic
- Digital AC Metering:
 - 3-Phase Volts (Phase to Phase and Phase to Neutral),
 - 3-Phase Amps
 - Frequency
 - kW, kVAR, KVA, pF, kWhr
- AC Protective Relaying:
 - 27/59 Under/Over Voltage
 - 32 Reverse Power
 - 51 Time Overcurrent
 - 81 O/U Under/Over Frequency
- Digital gauge display:
 - Oil Pressure (sender required by others)
 - Coolant Temperature (sender required by others)
 - Fuel Level (sender required by others)
 - Hourmeter
 - Tachometer
- 5 digital inputs for alarms / shutdowns
- Dedicated Output Contacts - Engine Crank; Run (30 VDC / 6 Amps)
- Three Programmable Output Contacts (30 VDC / 1 Amps)
- Event Logging (30 events)
- Pushbuttons:
 - Emergency Stop
 - Manual Start and Stop
 - Manual/Auto/Test
 - Lamp Test
 - Horn Silence
- Indicating Lights:
 - Common Alarm
 - Generator Ready (Voltage and Frequency Normal)

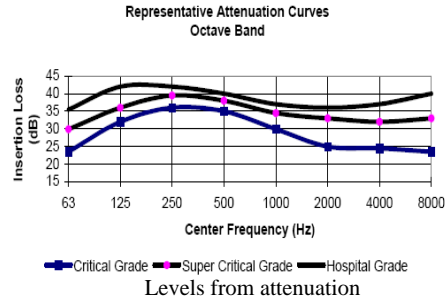
FEATURES

- Electrical Rating:**
- Single or three phase, 600VAC maximum, 50/60HZ, 4 wire
 - 12 or 24Vdc (nominal) supply, negative ground.
 - Dedicated Output Contacts - Engine Crank; Run (30 VDC / 6 Amps)
 - Three Programmable Output Contacts (30 VDC / 1 Amps)
- Enclosure:**
- Black Nema 1 enclosure c/w rubber mounts
- Engine Senders:**
- Oil pressure (1/8" NPT), Temperature (1/4"NPT) (Supplied loose for engine mounting).
- Requirements:**
- Exceeds requirements of CSA 282 and NFPA 110 Level

OPTIONAL SILENCER ACCORDING TO THE APPLICATION

Silencer with different levels from attenuation

- Critical Grade
- Super Critical Grade
- Hospital Grade



DOCUMENTATION AND OTHERS

- Manual of operation and maintenance
- Spare parts
- Maintenance
- Consulting

MISCELLANEOUS EQUIPMENT

- Batteries of 12 VDC with cables for battery connection with the Engine.

GENSET OPTIONS

Control Panel

USC 300C Control Panel is standard on all units see page 4 of spec sheet for standard features.

Another Type _____

Cooling System

Radiator

- Radiator Duct Flange
- Antifreeze drain Extension

Fuel system

- Fuel Water Separator
- Day tank
- Auxiliary fuel pump

Diesel Fuel Tank

- 1000 L (264.1 gal)
- 5000 L (1320.8 gal)
- 15000 L (3962.5 gal)

Exhaust System

- Critical Grade
- Super Critical Grade
- Hospital Grade

Engine Electrical system

Battery

- Lead-Acid
- NiCad

- Battery Rack
- Battery Charger Automatic

Generator

- Breaker in the alternator
- PMG excitation & DVR 2000 Regulator

OPTIONAL ACCESSORIES AVAILABLE FOR THE EQUIPMENT

Vibration isolation

- Rigid Spring Mounting
- Resilient Mounting

Filters

- Air Filter for Medium Dust Environments
- Air Filter of Heavy Dust Environments

Drain

- Oil drain Extension

Enclosures

- Sound Attenuated
- Weather Proof
- Stainless steel cover
- Trailer Mounting
- Interior lights AC or DC

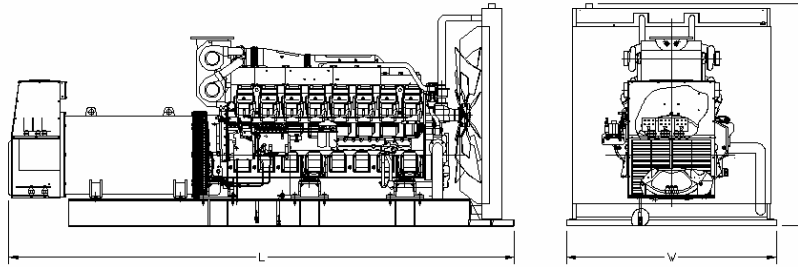
Heaters

- Jacket Water Heater
- Crankcase Oil Heater

Insulation Blankets

- Features:
(Temperature to 1260°C (2300°F), Non-Combustible, Highly Resistant to Vibration, Oil, Fuel, Grease, and Moisture Resistant Exterior, Personal Protection

DIMENSIONS



LENGTH	WIDTH	HEIGHT
mm (in)	mm (in)	mm (in)
5622 (221)	2330 (91.7)	2479 (97.6)

NOTE: General configuration not to be used for installation. See general dimension drawing for detail.

SERVICES

- Development of the project.
- Development of engineering.
- Equipment's Installation
- Engineering for special applications.
- Synchronies with utility network or more Gensets.
- Attention and technical support

INSTALLATION OPTIONS OF THE GENSET

- On-Site
- Acoustic Enclosure
- ISO Container
- Trailer

