VPOWER HOLDINGS LIMITED

HKEx Stock Code: 1608

P1600 DIESEL GENERATOR SET

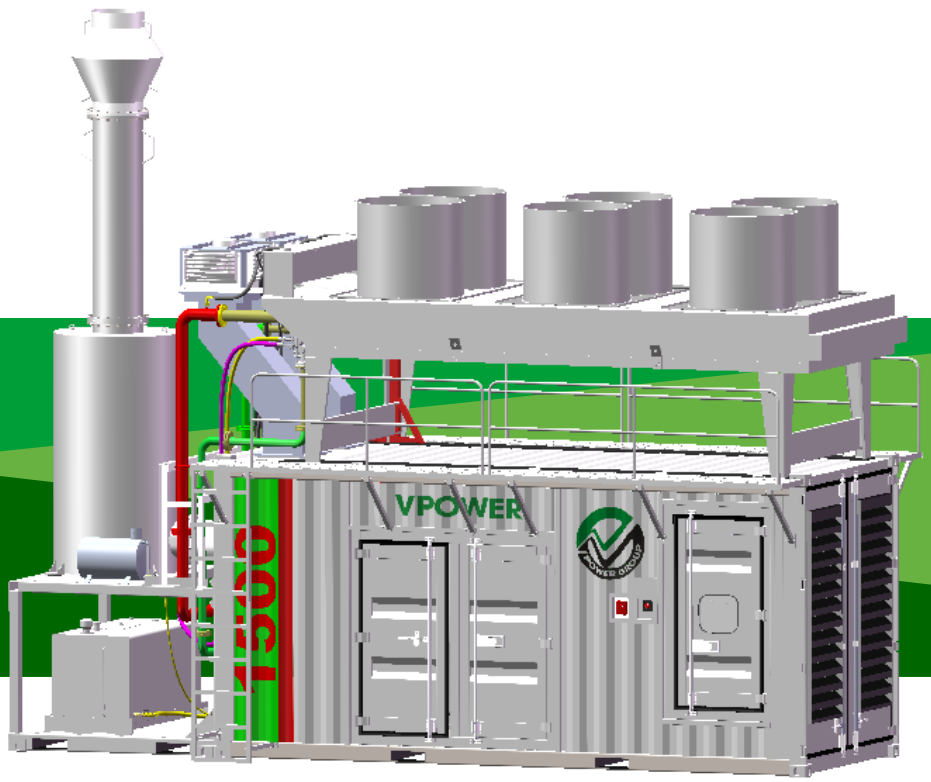
TECHNICAL DESCRIPTION

MTU 16V4000G23

For PRIME and STANDBY Application

50Hz 1500RPM

powered by



www.vpower.com

P1600

Packaged Power Unit

50Hz at 0.8 Power Factor 400V 3-Phase Rated Voltage

PRIME	STANDBY
1647kW / 2058 kVA@40℃	1767kW / 2208kVA@27℃

GENERATOR SET PERFORMANCE

Application

A factory designed generator set equipped with a standard AC/DC generator control panel. The generator set is ready to be connected to your fuel and power line to start up once the installation completed.

Applicable Definitions

Standby: Designed for emergency backup system. The standby rating is applicable to varying loads for the duration of a power outage, No overload capability and average Load Factor ≤ 85%. Max 500 operating hours annually.
Prime: Designed for continuous, peak load operations and emergency backup system at varying load in the event of normal utility power interruption. With 10% overload capability for a maximum of 1 hour in every 12 hours and average Load Factor ≤ 75%. Unrestricted operating hour.

Applicable Standard

Generator sets design, assembly and testing meet or exceed international standards, including IEC 34-1, BSEN60034, BS5000, ISO9001:2015, ISO14001:2015.
The power rating is set in accordance with ISO 8528, ISO 3046-1, GB/T2820-97 and NFPA110.

Structure Outline

The generator set has selected materials and equipment of high performance, which are durable and anti-vibration. The assembly work are fully accordingly to the quality control system. The single bearing alternator frame is coupled to the engine housing directly. With one end of the rotor is supported by bearing and the other end of rotor shaft is connected to the engine flywheel with a steel laminate plates.

The concept of the design and manufacturing is for easy operation and maintenance, to be compact and light weight. With the high level quality control system, we offer Reliability, Flexibility, and Economical power supply system to satisfy the demands from different kinds of application.

Advantage of VPower Genset

Designed, assembled and tested completely according to quality control system;
With industry-leading load factor (Standby ≥ 85%; Prime ≥ 75%);
With excellent load acceptance capacity of up to approx. 70%; significantly low fuel consumption; low emissions are derived by the high-pressure common rail fuel injection system;
Unique ADEC electronic control system, which have advantage on performance and maintenance;
With ESCM control system, excellent performance on high altitude application;
Advanced monitoring and communication systems, genset can operate from the island operation to grid parallel, fit with different operation.

Rubber Isolator Mounting

According to design and the rubber isolators are mounted between engine, alternator and its common skid base.

Applicable Conditions

Installation Place	: Outdoor
Ambient Temperature	: 0°C ~ 40°C
Ambient Humidity	: < 99%
Altitude	: 100 m

Painting Color

Engine	: MTU Blue
Alternator	: Black
Generator Control Panel	: Black
Skid Base	: Black

* Materials and specifications are subjected to change without prior notice.

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TECHNICAL DATA

50Hz / 1500RPM / 400V

ENGINE	Maker and Model		MTU 16V4000G23
	Rating Type		Prime / Standby
	Engine Output (Prime / Standby)	HP	2445/ 2689
		kWm	1798/ 1978
	Engine Load Acceptance	kWe	~1155 (~70%)
	Aspiration		Turbocharged; Water Charge Air Cooling
	Cylinder Arrangement		16V
	Type		Water Cooled, 4 Cycles, Overhead Valve
	Bore x Stroke	mm x mm	170 x 210
	Piston Displacement	Liter	76.3
	Starting Method		Electric Motor, 24V – 9.0kW x 2
	Charging Alternator		DC 24V – 35A (Brushless)
	Cooling Fan and Diameter	mm	8 Blades Pusher Type, 1891
	Oil Cooler		Water Cooled, Multi-plate Type
	Air Cleaner		Dry Type, 2 Stage Paper Element
	Stop Solenoid		Energized to Run Mode
	Flywheel Housing / Flywheel		SAE #00 / SAE #21 (Metric Tread)
	Flywheel Ring Gear Teeth		182
	Battery (Lead Acid Type)		DC 12V – 200Ah x 4 pcs
	Frequency Regulation, Stead State	%	≤±0.5
	Frequency Regulation, Transient State	%	≤±10
	Frequency Stable Time	s	2
	Frequency Waving	%	≤±0.25
	Frequency Regulation Range	%	±5.0
ENGINE LUBRICANT	Oil Pan (High / Low Level)	Liter	240/ 210
	Oil Filter /By-pass Filter	Liter	60
	System Total	Liter	300
	Grade		SAE #15W-40
			API, Class CH, CI
ENGINE COOLANT	Radiator and Ambient Temp.	°C	Corrugate Fin Type, 40
	Cooling System		Forced Circulation by Centrifugal Water Pump
	Engine Capacity	Liter	225
	Radiator Capacity	Liter	330
	Radiator Heat Rejection	kW	1050
ENGINE DATA	Pressure Mean Effective (PME)	bar	20.7
	Mean Piston Speed	m/s	10.5
	Sound Level (Average at 1m)		
	Full Load	dB(A)	107
	Speed Regulation	%	Electronically controlled injection; Common Rail System
	Thermostat (Wax Type)		
	Water Coolant	°C	Cracking 79, Fully Open 87
	Engine Shutdown Device		
	Coolant Temp (Sensor Type)	°C	102 +3%
	Oil Pressure (Sensor Type)	kPa	98 + 3% (1.0 + 3% bar)
FUEL CONSUMPTION	BSFC (at 100% Load)	g/kWh	192
	Lubricating Oil (Nominal Value)	%	0.3
	Fuel Rate	Liter/h	374

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* Diesel density(for reference): 0.83g/ml.

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ALTERNATOR	Model		PI734F1
	Construction		Single Bearing, Self-Ventilated
	Control System		MX321 with PMG Excited
	Insulation		Class H
	Protection		IP23
	Rated Power Factor		0.8
	Efficiency (Cont. 100%)	%	96
	No of Pole and Phase		4 Poles 3 Phase 4 Wire
	Stator Winding		Double Layer lab
	Winding Pitch		2/3
	Winding Leads		6
	Voltage Regulation, Stead State	%	≤±0.5
	Voltage Regulation, Transient State	%	+20 ~ - l5
	Voltage Stable Time	s	≤0.5
	Voltage Waving	%	≤±0.5
	Voltage Regulation (at No Load)	%	95 ~ 105
	Voltage Waveform Distortion		
	No Load	%	< 1.5
	Non-Distorted Balanced Linear Load	%	<5
	Maximum Overspeed	rpm	2250
	Telephone Interference	%	THF<2 / TIF<50
	Voltage Dip at 15%	kVA	~1860kVA
	Voltage Dip at 20%	kVA	~2610kVA
AIR VENTILATION	Combustion Air Flow	m3/min	138
	Cooling Fan Air Flow	m3/min	1920
	Alternator Air Flow	m3/min	150.0
	Total	m3/min	2208
EXHAUST GAS	Gas Flow (at Full Load)	m3/min	348
	Temperature (at T/C Outlet)	°C	485
	Allowable Back Pressure	mbar	85
	Bellow Size (Inner Diameter)	mm	250 x 2
RECOMMEND	Diesel Fuel (Grade)		ASTM D975, 1-D or 2-D
	Pipe Size of Fuel Line		
	Supply (Minimum)	Inch	1.5
	Return (Minimum)	Inch	1.0
GENERATOR CONTROL PANEL	Genset Controller		DEIF AGC242
	Analog Measurement	°C	Coolant Temperature
		Bar	Engine Oil Pressure
		PRM	Engine Speed
		V	Battery Voltage
		Hrs	Hour Run
		%	Fuel Level (Optional)
	AC Measurement	V	Gen U1 – U3
		A	Gen I1 – I3
		Hz	Gen Frequency
		kW	Gen Active Power
		kVAr	Gen Reactive Power
		kWh	Gen Power Consumption
		V	Mains U1 – U3
		Hz	Mains Frequency
		V	Mains Voltage (L1-L2, L2-L3, L3-L1)

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GENERATOR CONTROL PANEL	Default Protection Settings		
	Low Oil Pressure	Bar	< 1.5
	High Coolant Temperature	°C	> 100
	Over Speed	RPM	> 10% of Rated Speed
	Fail to Start	Sec.	> 39 (failed to start up after 3 attempts)
	Low / High Battery Voltage	V	18 / 30
	Charge Fail	V	< 18
	Under / Over Gen Voltage	V	70% / 110% of Rated Voltage
	Under / Over Gen Frequency	Hz	85% / 110% of Rated Frequency
	Over Current	A	> 120% (IDMTL)
	Push Buttons		
	MODE →		Selection of Genset operation mode (OFF, MAN, AUT push button)
	HORN RESET		Deactivates the "HORN"
	FAULT RESET		Acknowledges faults and alarms
	START		Start Genset
	STOP		Stop Genset
	MCB ON/OFF		Manual open/close the Mains CB
	PAGE		Cyclic selection of the display mode (MEASUREMENT ◁ ▷ ADJUSTMENT)
	△		Select set point, screen or increase set point value
	▽		Select set point, screen or decrease set point value
	✓		Confirm set point value
	LED's (from left to right)		MAINS FAILURE: Green LED activated when the mains present, green LED unlit while 'mains failure' occurred and Genset does not run. MCB ON: Green LED activated if MCB is closed. It actuated by feedback signal. GCB ON: Green LED activated if GCB is closed. It actuated by feedback signal. GEN VOLTAGE PRESENT: Green LED activated when the genset present, green LED unlit while 'genset output failure' or genset does not run.
	Emergency Stop Button		Stop Genset in case of emergency
	Key Switch		ON/OFF Power to the control panel
	LED		Common Engine Fault LED
	Buzzer		Audible alarm
Switchgear	Current Switch model		AS-32E3-32H M2D2D2BX NG5 U2 C/3200A 3P LS/(Ics:85KA 400V-690V)/Operation voltage： AC220V

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V500G GENSET CONTROL SYSTEM

- Genset Output Data Display and Protection
- Genset Status Display and Protection
- Genset Remote Start-up and Auto Start-up
- Power Monitoring System
- Fault LED Indicators
- Modular design and expandable

DEIF AGC242 Genset Control System Features:

AGC242 is a control unit containing all necessary functions for protection and control of a genset. It can be used as a single unit for one genset, or a number of AGCs can be connected in a complete power management system for synchronising projects, islanded or paralleled to the mains. The AGC242 contains all necessary 3-phase measuring circuits, and all values and alarms are presented on the display.

The AGC242 is a compact all-in-one unit designed for the following applications：

① Island mode
② Automatic Mains Failure
③ Fixed power
④ Peak shaving
⑤ Load takeover
⑥ Mains power export

The plant modes are configurable, and it is possible to change the plant mode on the fly both in single and in power management applications.

Standard functions：

(1) Auto/Manual Start-Stop
(2) Phase sequence detects and protection
(3) 240 x 128 pixel backlight STN
(4) Genset overspeed protection
(5) Oil pressure display and protection
(6) Coolant Temperature display and protection
(7) DC Volt measurement and Over/Under Volt protect
(8) Fuel Level detects and alarm
(9) Lube Oil Timer
(10) Electrical Measurement
(11) LED Indicator for audio / visuals alarm
(12) Hour-run meter
(13) Over 200 Event Log
(14) Including 1 x USB port for PC configuration

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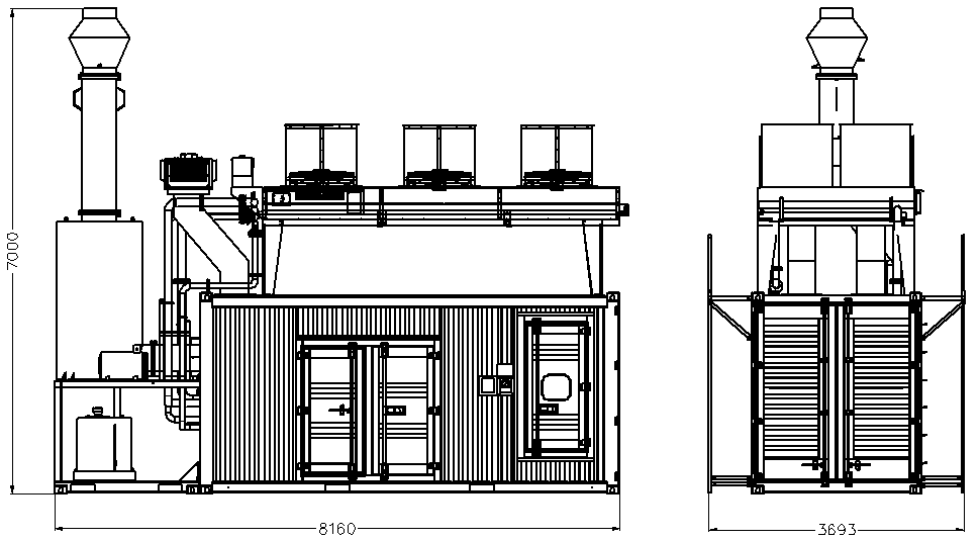
Rated Power (kWe/kVA)

Generator (Maker / Model)	Voltage	Prime Power Rating Output		
		Radiator Driven by Fan Motor		
		kWe	kVA	AMPs
Stamford PI734F1	400V	1647	2058	2971
Generator (Maker / Model)	Voltage	Standby Power Rating Output		
Stamford PI734F1	400V	1767	2208	3188

* cos phi =0,8

Generator Set layout, Dimensions and Weight



Genset Model	Weight (kg)	Dimensions （L×W×H） mm
P1600	27445	8160 X 3693 X 7000

Optional Accessories

※ Base frame fuel tank or separate fuel tank
※ 50℃ radiator for high amb. temp. (available for open type, standard for enclosure type)
※ Automatic changeover switch (ATS)
※ Deif, ComAp or other famous brand controller
※ ABB, Schneider, Siemens or other famous brand circuit breakers
※ Adjustable earth fault protection and earthing connection w/main CB
※ Adjustable fuel level sensor
※ Genset manual oil pump
※ Genset fuel oil cooler
※ Genset radiator heater/fuel oil heater/lub oil heater
※ Genset automatic fuel supply system
※ Genset anti-freeze heater
※ Genset DE housing-RTD/thermistor/PT100
※ Other genset accessory upon special request。

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