

HKEx Stock Code: 1608

# P1600 DIESEL GENERATOR SET

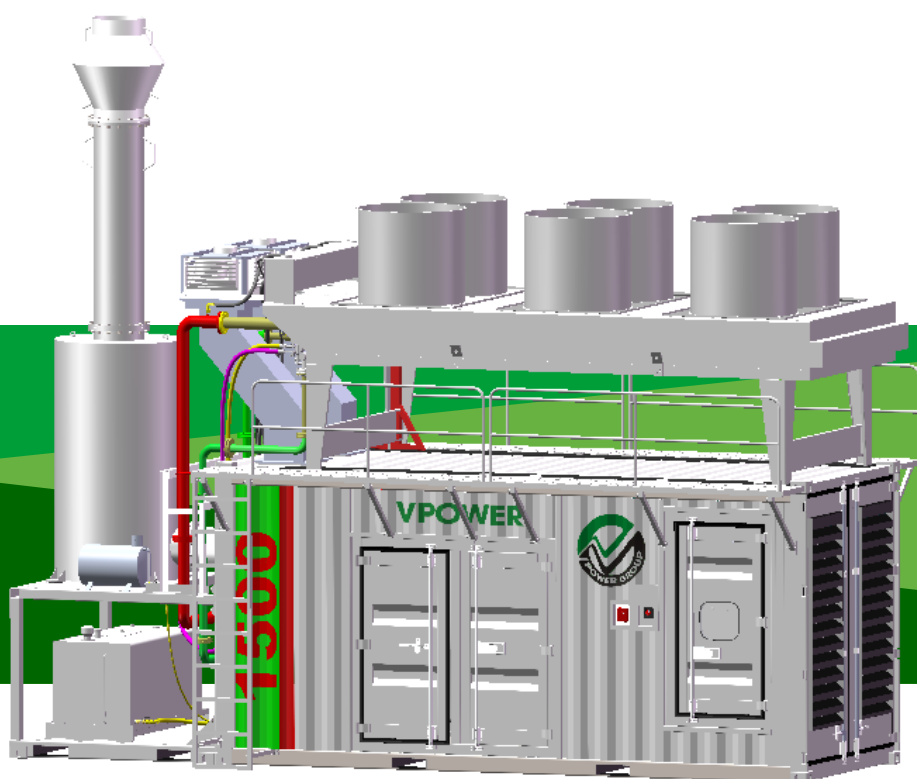
## TECHNICAL DESCRIPTION

MTU 16V4000G23

For PRIME and STANDBY Application

50Hz 1500RPM

powered by



# P1600

Packaged Power Unit

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

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

### 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 is 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  $\leq 85\%$ . 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  $\leq 75\%$ . 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 is fully according 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  $\geq 85\%$ ; Prime  $\geq 75\%$ );
- 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		Painting Color	
Installation Place	: Outdoor	Engine	: MTU Blue
Ambient Temperature	: 0°C ~ 40°C	Alternator	: Black
Ambient Humidity	: < 99%	Generator Control Panel	: Black
Altitude	: 100 m	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)	HP2445/ 2689
		kWm1798/ 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 mm170 x 210
	Piston Displacement	Liter76.3
	Starting Method	Electric Motor, 24V – 9.0kW x 2
	Charging Alternator	DC 24V – 35A (Brushless)
	Cooling Fan and Diameter	mm8 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	s2
	Frequency Waving	%≤±0.25
	Frequency Regulation Range	%±5.0
ENGINE LUBRICANT	Oil Pan (High / Low Level)	Liter240/ 210
	Oil Filter /By-pass Filter	Liter60
	System Total	Liter300
	Grade	SAE #15W-40 API, Class CH, CI
ENGINE COOLANT	Radiator and Ambient Temp.	°C
	Cooling System	Corrugate Fin Type, 40 Forced Circulation by Centrifugal Water Pump
	Engine Capacity	Liter225
	Radiator Capacity	Liter330
	Radiator Heat Rejection	kW1050
ENGINE DATA	Pressure Mean Effective (PME)	bar20.7
	Mean Piston Speed	m/s10.5
	Sound Level (Average at 1m)	
	Full Load	dB(A)107
	Speed Regulation	%Electronically controlled injection; Common Rail System
	Thermostat (Wax Type)	
	Water Coolant	°CCracking 79, Fully Open 87
	Engine Shutdown Device	
	Coolant Temp (Sensor Type)	°C102 + 3%
FUEL CONSUMPTION	Oil Pressure (Sensor Type)	kPa98 + 3% (1.0 + 3% bar)
	BSFC (at 100% Load)	g/kWh192
	Lubricating Oil (Nominal Value)	%0.3
	Fuel Rate	Liter/h374

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

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TECHNICAL DATA		
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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 ~ - 15
	Voltage Stable Time	≤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	2250
AIR VENTILATION	Telephone Interference	THF<2 / TIF<50
	Voltage Dip at 15%	~1860kVA
	Voltage Dip at 20%	~2610kVA
EXHAUST GAS	Combustion Air Flow	138
	Cooling Fan Air Flow	1920
	Alternator Air Flow	150.0
	Total	2208
RECOMMEND	Gas Flow (at Full Load)	348
	Temperature (at T/C Outlet)	485
	Allowable Back Pressure	85
	Bellow Size (Inner Diameter)	250 x 2
GENERATOR CONTROL PANEL	Diesel Fuel (Grade)	ASTM D975, 1-D or 2-D
	Pipe Size of Fuel Line	
	Supply (Minimum)	1.5
	Return (Minimum)	1.0
GENERATOR CONTROL PANEL	Genset Controller	DEIF AGC242
	Analog Measurement	Coolant Temperature
		Engine Oil Pressure
		Engine Speed
		Battery Voltage
		Hour Run
		Fuel Level (Optional)
	AC Measurement	Gen U1 – U3
		Gen I1 – I3
		Gen Frequency
		Gen Active Power
		Gen Reactive Power
		Gen Power Consumption
		Mains U1 – U3
		Mains Frequency
		Mains Voltage (L1-L2, L2-L3, L3-L1)

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TECHNICAL DATA		
50Hz / 1500RPM / 400V		
GENERATOR CONTROL PANEL	Default Protection Settings	
	Low Oil Pressure	Bar < 1.5
	High Coolant Temperature	°C > 100
	Over Speed	RPM > 10% of RatedSpeed
	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.  MCBON: Green LED activated if MCB is closed. It actuated by feedback signal.  GCBON: 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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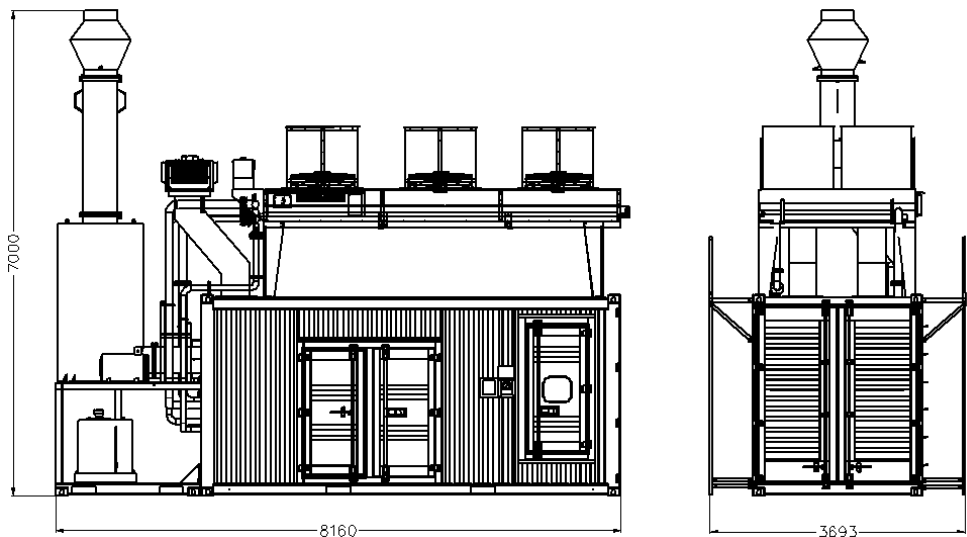
Packaged Power Unit

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 ( LxWxH ) mm
P1600	27445	8160 X 3693 X 7000

## Optional Accessories

- ※ Base frame fuel tank or separate fuel tank
  - ※ 50°C 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.