



VPS Series Stationary Gensets

For Continuous Duty Power Generation,
Cogeneration, and Trigeneration



An MTU Aero Engines Company

Gas Turbine Stationary Power

The Vericor gas turbine gensets are available based on the ASE40 and ASE50B Gas Turbines. VPS3 and VPS4 gensets can be used in a variety of industrial applications. Utilization would include stationary utility power, cogeneration and trigeneration, emergency standby, distributed power and portable power, among other.

VPS Gensets Configurations

The generator sets can be installed indoors or outdoors on a simple concrete slab. Designs are available in a single skid configuration with a variety of subsystem scope, fuel system and air handling options.

The VPS3 and VPS4 GTG are available in the following configurations:

- Single Skid Enclosed ODP Generator Package w/ Free Standing Controls
- Extended Single Skid Enclosed ODP Generator Package with Control Room Option
- Separate Control Building Option

ASE50B & ASE40 Gas Turbines

The ASE50B and ASE40 gas turbines are an industrial version of the TF50B and TF40 marine engines. These turbines have the following features:

- Runs on either 100% natural gas or liquid fuel and changeover while operating under full load
- Modular construction simplifies on-site maintenance
- High power to weight ratio minimizes package weight and dimensions
- Direct mount to driven equipment eliminates alignment issues
- Superior cold start capability - ideal for standby applications
- 60,000 hours between scheduled shop visits reduces maintenance costs



VPS3 - USA



Sierra Pine - USA

VPS Series Scope of Supply

Standard Equipment

ASE Series gas turbine
Epicyclic reduction gear (1,500 rpm)
Generator (ODP)
(synchronous, 50Hz, 6.6 kV, 0.8 PF)

Natural gas fuel system

Lube system (water cooled)

Electro hydraulic start system

Structural steel base, weatherproof acoustic enclosure (gas turbine & reduction gear) generator with enclosure ventilation air system

Combustion air intake system (barrier filter)

Package PLC, generator controls, uninterruptible power supply (UPS)

Exhaust gas diffuser and expansion metal bellows

Optional Equipment

Gas turbine water wash system

Epicycling reduction gear (1,800 rpm)

Open ventilated and totally enclosed air cooled (TEWAC) enclosures, 60Hz, other voltages, high voltage generator switchgear

Distillate fuel system, dual fuel system, fuel gas conditioning skid, fuel gas compressor, water injection system

Oil/air cooler

Pneumatic start system

No enclosure, no fire and combustible gas detection or suppression systems

Self cleaning filter, chilling, evaporative cooling

MCC, HMI station, control room building, remote control interfaces

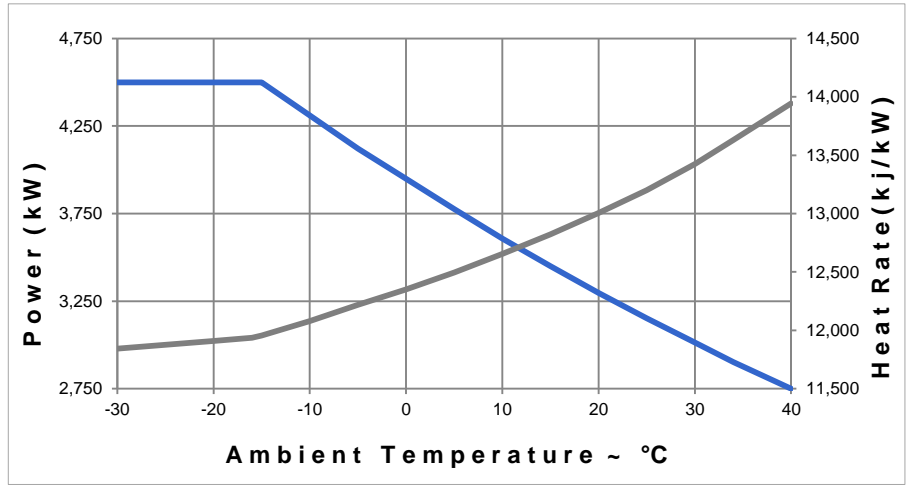
Exhaust silencer, stack, heat recovery steam generator (20,000 - 60,000 lbs/h)

Performance

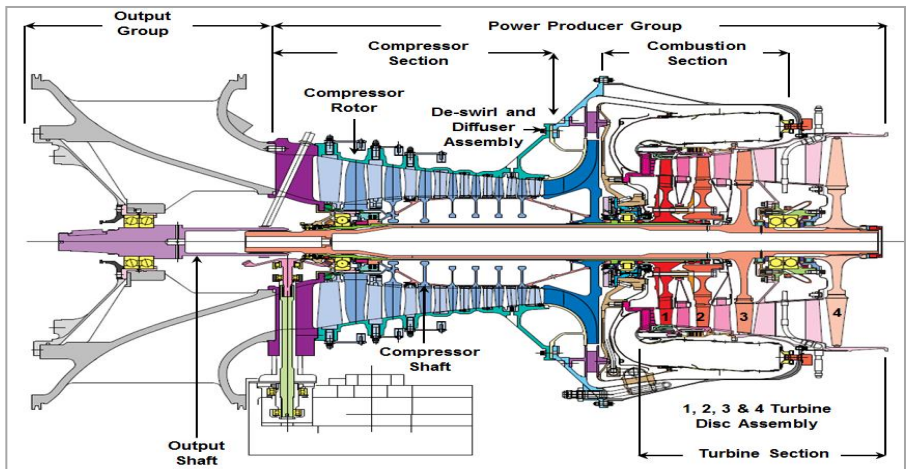
VPS4 - Power and Heat Rate vs Ambient Temperature



Wood Manufacturing Plant - USA

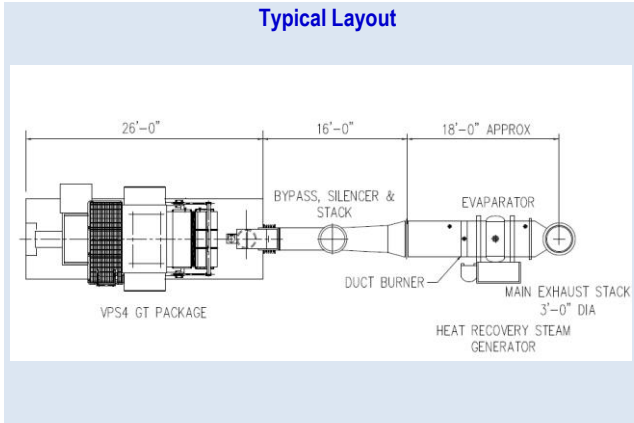


ASE50B Cross-Section

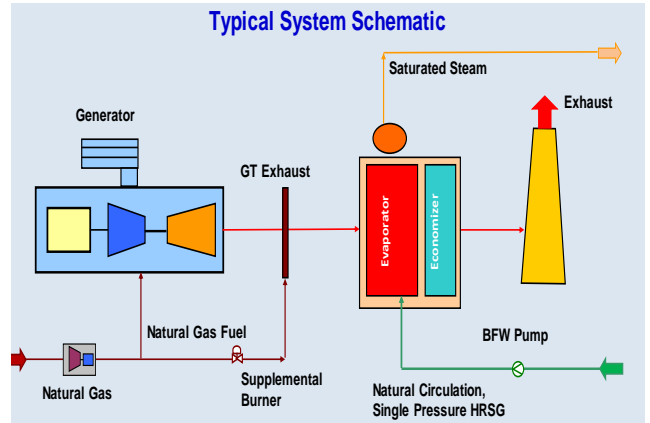


Cogeneration

Typical Layout



Typical System Schematic



VPS Series Features



VPS4 - Middle East



Cogeneration Plant - USA

| Power Generation | | | |
|----------------------------------|---------|-------------|-------------|
| Nominal Performance Natural Gas | | VPS3 | VPS4 |
| Output power | kW | 3,086 | 3,451 |
| Heat rate | Btu/kWh | 13,415 | 12,025 |
| | kJ/kWh | 14,153 | 12,686 |
| Thermal efficiency | % | 26.8 | 28.4 |
| Fuel flow | lbs/h | 1,910 | 2,020 |
| | Kg/h | 866 | 916 |
| Fuel pressure required (min/max) | psig | 200/250 | 250/300 |
| | kPa | 1,379/1,723 | 1,723/2,068 |
| Exhaust gas flow | lbs/s | 28.0 | 30.1 |
| | Kg/s | 12.7 | 13.7 |
| Exhaust gas temperature | °F | 1,115 | 1,080 |
| | °C | 602 | 582 |

Performance at 59F, sea level, RH60% 3" inlet/4" exhaust loss, generator and gear losses included, LHV 20,584 Btu/lb

| Physical Dimensions | | | |
|--------------------------|----|--------|--------|
| Power generation package | | | |
| Length | ft | 25.3 | 25.3 |
| | m | 7.7 | 7.7 |
| Height | ft | 20.0 | 20.0 |
| | m | 6.1 | 6.1 |
| Width | ft | 8.6 | 8.6 |
| | m | 2.6 | 2.6 |
| Weight (Aprox) | lb | 95,000 | 95,000 |
| | kg | 43,120 | 43,120 |

| Combined Heat & Power - CHP | | | |
|-----------------------------|-------|--------|--------|
| Net power output | kW | 2,910 | 3,328 |
| Net plant efficiency* | % | 80.3 | 81.1 |
| Steam pressure | psia | 150 | 150 |
| | bar | 10.3 | 10.3 |
| Steam temperature | °F | 358 | 358 |
| | °C | 181 | 181 |
| Steam mass flow | lbs/h | 21,150 | 21,700 |
| | Kg/h | 9,590 | 9,842 |

Performance at 59F, sea level, RH60% 4" inlet/10" exhaust loss, generator and gear losses included, LHV 20,584 Btu/lb

* Stack temperature of 316°F (158°C). Higher plant efficiencies are attainable with lower stack temperatures

Maintenance Schedule

| Recommended Frequency - Hrs | 500 | 10,000 | 30,000 | 60,000 |
|--|--------------|--------|--------|--------|
| Preventive - Inspection / Check | | | | |
| Initial Lube Oil Sampling | ● | | | |
| External Inspection | ● | | | |
| Chip Detector Inspection | On Condition | | | |
| Compressor Cleaning | On Condition | | | |
| Lube Oil Sampling | | ● | | |
| Inlet Inspection | | ● | | |
| Exhaust Inspection | | ● | | |
| Fuel Manifold/Nozzle Inspection | | ● | | |
| Spark Igniters Inspection | | ● | | |
| Maintenance | | | | |
| Boroscope Inspection | | ● | | |
| Hot Section Refurbishment | | | ● | |
| Major Inspection | | | | ● |



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