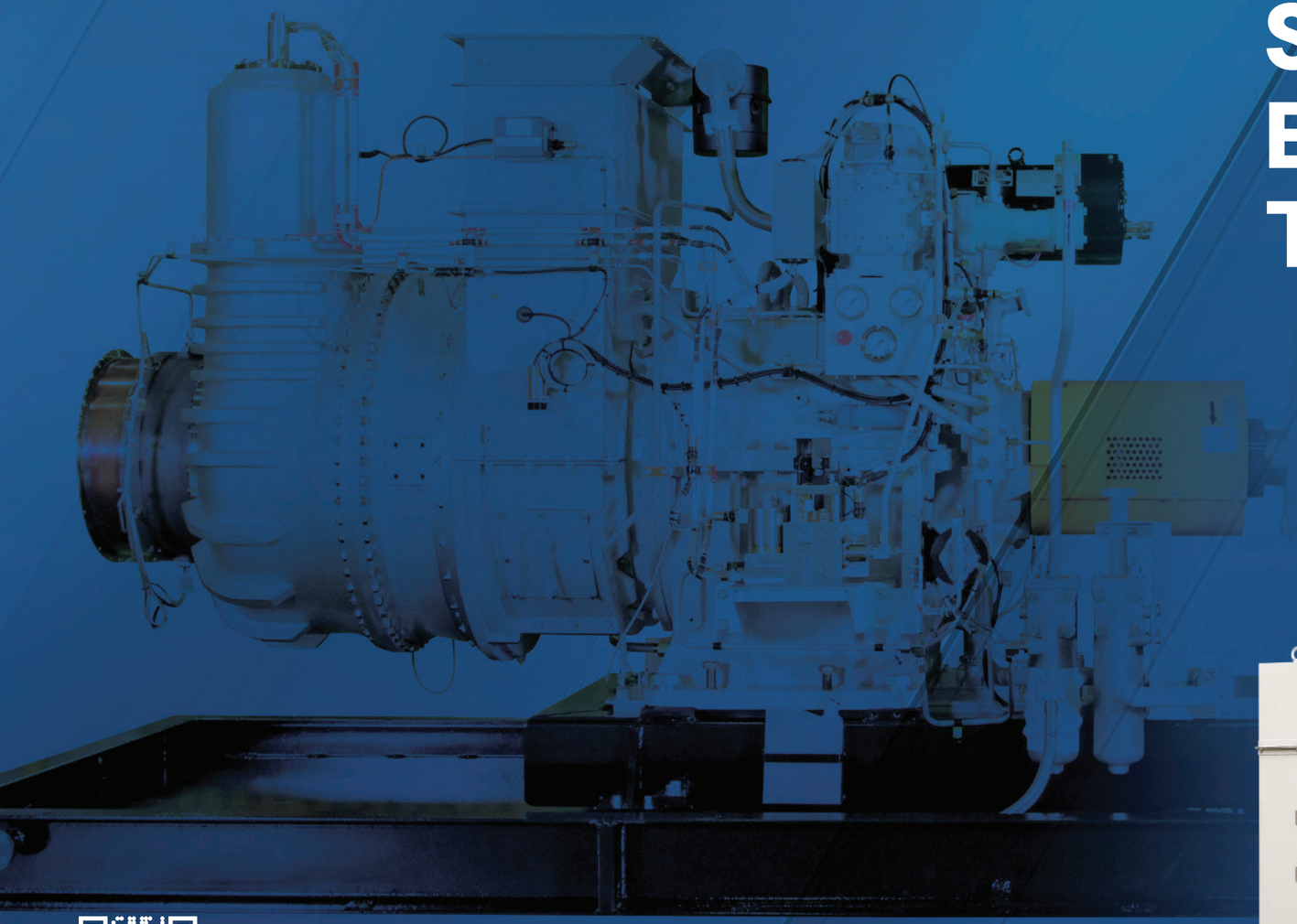


# STANDBY GEN-SET
# Emergency Gas Turbine Generator


**SA Engineering Co., Ltd.**

**Head office** : 40, Sinildong-ro 67beon-gil, Daedeok-gu, Daejeon, Republic of Korea
**TEL.** +82-42-931-8240 | **FAX.** +82-42-931-8370
**Seoul Office** : C605, Munjeong Hyundai Knowledge Industry Center 1-2, 644-2, Munjeong-dong, Seoul, Republic of Korea | **TEL.** +82-2-488-4685
**Shanghai office** : A710, Hongqiaojingzuo, No.280-2, Hongjing Road, Shanghai, 201103

www.saeg.co.kr

SA ENGINEERING

# CONTENTS

# Wherever stable and highly reliable power generation is needed, the cutting-edge technologies of Kawasaki and SA Engineering are always there for you.

**We will always put customer satisfaction first.**

SA Engineering always puts customer satisfaction first. We strive to provide the highest quality and services, and will continuously develop and produce better products with ongoing technological development and years of experience.

We will continuously grow and evolve alongside our customers, striving for excellence. Through ESG management, we aim to create social value, enhance corporate value, and develop into a more sustainable and responsible company.

We will implement diverse initiatives to strengthen communication, build strong relationships with our customers, and foster mutual growth within society. Based on our social responsibilities, we will attract highly skilled talents and provide an environment where talented individuals can display their maximum potential, and ultimately become a company that creates better value.

SA Engineering will expand its gas turbine generation business by using the gas turbines from Kawasaki Heavy Industries with proven performance and reliability to lead the market.

# Advantages of Emergency Gas Turbine Generator Package

## Excellent startup reliability

Unlike a diesel engine, there are no ignition failures during startup with the emergency gas turbine generator because it uses a continuous combustion system with a dual-injection nozzle installed in a can-type combustor. Furthermore, since there is no cooling water system, there are fewer inspection items before startup. The system starts up quickly and precisely and load can be applied immediately without warm-up operation. Therefore, the remote control device is simple, and automatic and unmanned operation is easy to perform.

## Stable frequency characteristics

The emergency gas turbine generator features a single-shaft design, which is optimal as the power source of the generator. Therefore, unlike diesel engines, it has less speed fluctuations and can achieve a stable frequency variation rate (that cannot be obtained from other engines) during normal operation or when applying or removing full load.

## Excellent instantaneous overload absorption capability

The main shaft of the emergency gas turbine generator rotates at a high speed of 22,000-53,000 rpm. As a result of reducing this high rotation speed to 1,500-1,800 rpm, the equivalent moment of inertia increases, enabling the easy absorption of instantaneous overload when starting a large capacity induction motor. Because it can withstand much greater overloads than diesel generators in the same class, the gas turbine shows its true value in emergency equipment that is often under instantaneous load.

## Simple maintenance

Unlike diesel engines, the emergency gas turbine generator has no reciprocating or sliding parts, such as pistons and cylinders, and thus there is no wear and tear on parts. In addition, since there are fewer parts, reliable startup and operation can be ensured with only simple daily inspections. If the gas turbine generator is installed for emergency purposes, routine inspections can be carried out with just a 10-minute trial run once a month.

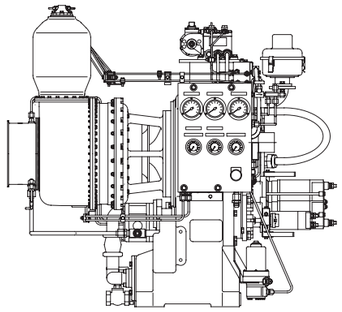
## Cooling water is unnecessary

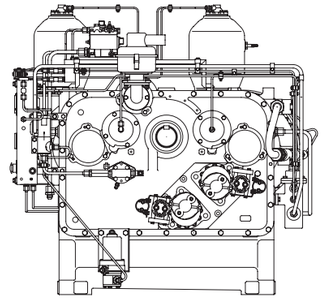
The emergency gas turbine generator is an air-cooled system, so it does not require cooling water. Therefore, maintenance of cooling water is unnecessary, and there are no accidents due to freezing or water shortages. Furthermore, this equipment is more reliable than diesel engines, which require cooling water. Therefore, it can save the costs of cooling water equipment and pipe installation, and the system installation location can also be chosen freely.

## Advanced noise reduction solutions

Because the noise generated by the emergency gas turbine generator is in the high-frequency range, mechanical noise can be reduced with even a simple package. Additionally, noise can easily be reduced further by using a silencer. Noise reduction can be achieved more easily compared to the anti-noise measures required for diesel engines, which generate low frequency sounds. The generator can also easily meet the noise levels set by environmental regulations.







## Low vibration and excellent seismic durability

Because the emergency gas turbine generator uses a rotary motion mechanism with no reciprocating parts, there is almost no vibration. For this reason, there is no need for special foundation work or vibration isolation during installation. In addition, unlike diesel engines, there is almost no need for resilient support systems such as vibration-proof rubber and springs as anti-vibration measures. As a result, the system has outstanding seismic durability since low-frequency resonance caused by vibration does not occur.

## Environmentally friendly exhaust emissions

Since the emergency gas turbine generator performs complete combustion due to the nature of its system, there are lower levels of SOx (sulfur oxides) and NOx (nitrogen oxides) in the exhaust gas, thus eliminating concerns about air pollution.

## Easy transport/installation and small installation area

Compared to diesel engines in the same class, emergency gas turbine generators are lightweight and compact. Because of this, their packages are also compact, and it is easy to transport and install them in confined spaces, such as rooftops and basements. Since cooling water equipment is unnecessary, the generator requires less installation space, allowing for more efficient use of available area.

## Compact package

The gas turbine engine and reducer are integrated into a single unit and connected by a rubber/shear pin coupling, so both components can be mounted on a single base. This results in a compact package.

## High-performance and high-quality gas turbines

The gas turbines at the heart of the emergency gas turbine generator package deliver world-class performance. This generator also features a single-shaft design that is optimal as a power source. It is rationally engineered and manufactured, and recognized internationally for its superior quality.

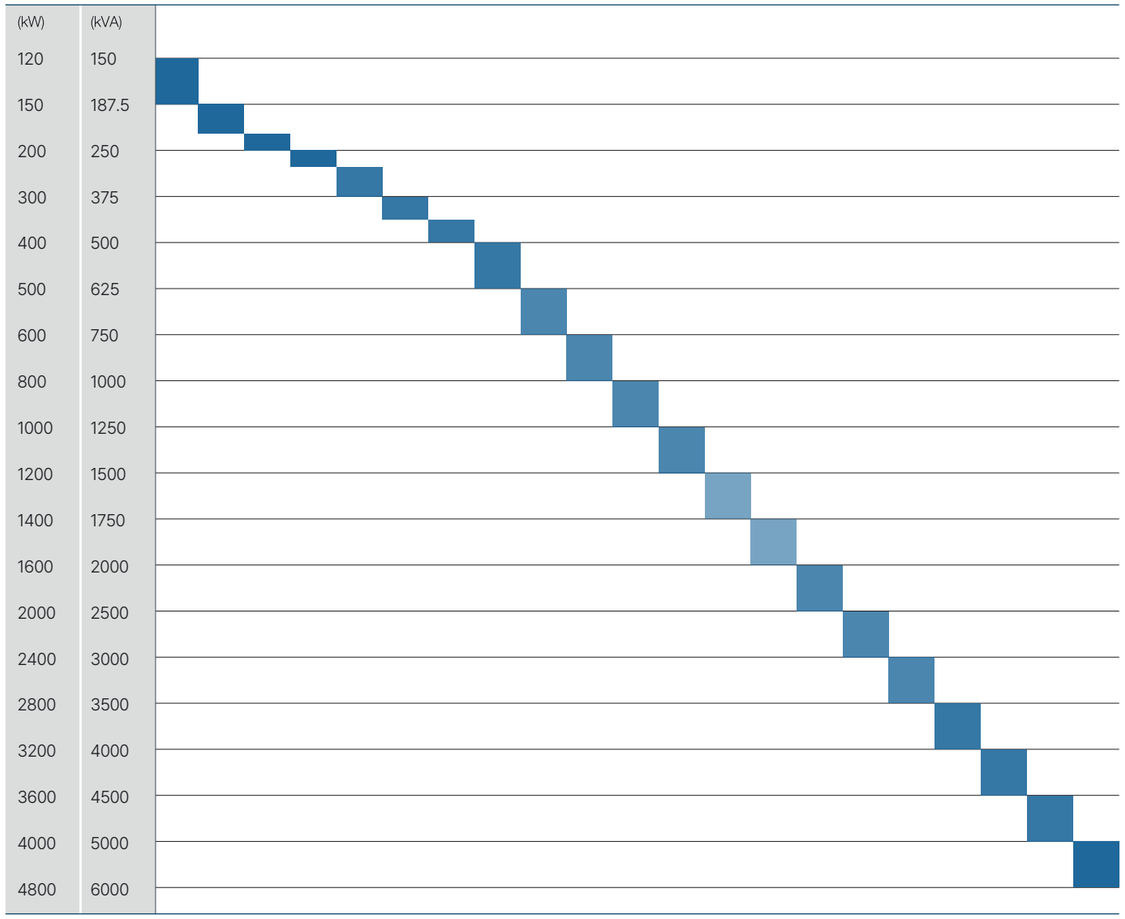
## Thorough A/S support for maintenance

Quick and thorough maintenance support is available upon customer request anytime, anywhere. In addition, parts are supplied at affordable prices, and thorough maintenance is provided according to our periodic inspection service agreement. Therefore, the best operating condition can be maintained with the perfect maintenance support from SA Engineering.

# Major Specifications

| Item \ Model | | PS 200 | PS 250 | PS 250S | PS 300 | PS 375 | PS 500 | PS 500S | PS 625 | PS 750 | PS 1000 | PS 1250 | PS 1500 | PS 1750 | PS 2000 | PS 2500 | PS 3000 | PS 3500 | PS 4000 | PS 4500 | PS 5000 | PS 6000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rated output (kVA) | Emergency (40°C) | 187.5 | 225 | 250 | 300 | 375 | 437.5 | 500 | 625 | 750 | 1,000 | 1,250 | 1,500 | 1,750 | 2,000 | 2,500 | 3,000 | 3,500 | 4,000 | 4,500 | 5,000 | 6,000 |
| Generator | Voltage(V) | 380/220 ~ 6,600 | | | | | | | | | | | | | | | | | 3,300 / 6,600 | | | |
| | Frequency(Hz) | 50 / 60 | | | | | | | | | | | | | | | | | | | | |
| | No. of poles(P) | 4 | | | | | | | | | | | | | | | | | | | | |
| Gas Turbine | | S1A-01 | S1A-02 | S1A-03 | S1A-06 | S1T-02A | S1T-02 | S1T-03 | S2A-01A | S2A-01 | M1A-01A | M1A-01 | M1A-03 | M1A-06 | M1A-21 | M1T-01S | M1T-03 | M1T-06 | M1T-21 | M1T-23S | M1T-26 | M1T-33 |

## Standard rated output selection




# Standard Components

The basic components of the emergency gas turbine generator package include a generator set, in which the generator and gas turbine are mounted on a single common bed, along with a control panel, circuit breaker panel, exhaust silencer, fuel tank, etc.

### Generator set

This system features a generator, gas turbine, and auxiliary equipment mounted on a common bed. It is available in two standard types: indoor and outdoor.

### Control panel and short circuit breaker panel

This device combines a circuit breaker panel and a gas turbine control panel. There are two types: a generator set-mounted type and a separate type. However, the mounted type is only available for low voltage in PS200–300.

### Fuel tank

With a standard capacity of 990 liters, adjustments can be made according to specific site requirements.

### Starting system

There is an electrical type and a pneumatic type. The electrical type consists of a battery and charger. The pneumatic type consists of an air tank, air compressor, and starting valve unit.

### Exhaust silencer

A standard exhaust silencer is provided separately for the generation unit.

| Model name | | Type | Automatic starting generator panel | Starting system |
|---|---|---|---|---|
| PS200<br>PS250<br>PS250S<br>PS300 | A-C / A-R<br>B-C / B-ER | Outdoor type<br>Indoor type | Mounted type/Separate type<br>(mounted type for low voltage) | Electrical type |
| PS375<br>PS500<br>PS500S<br>PS625<br>PS750 | A-CR<br>B-ER | Outdoor type<br>Indoor type | Separate type | |
| PS1000<br>PS1250<br>PS1500<br>PS1750<br>PS2000<br>PS2500<br>PS3000<br>PS3500<br>PS4000<br>PS4500<br>PS5000<br>PS6000 | A-CR<br>B-ER | Outdoor type<br>Indoor type | | Electrical type/Pneumatic type |

* A: Outdoor type B: Indoor type C: Cubicle E: Enclosure R: Separately installed on control panel and circuit breaker panel

# PS200/250/250S/300

## Standard performance

- Atmospheric pressure

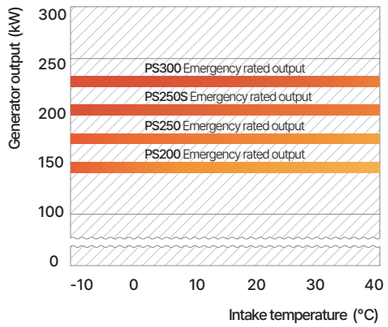
  99.6kPa(1,016kg/cm²)
  (equivalent to altitude of 150m)

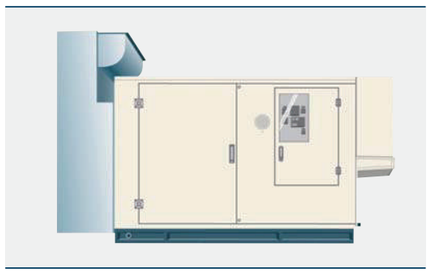
- Air intake duct pressure loss

  981Pa(100mmAq)

- Exhaust duct pressure loss (voltage)

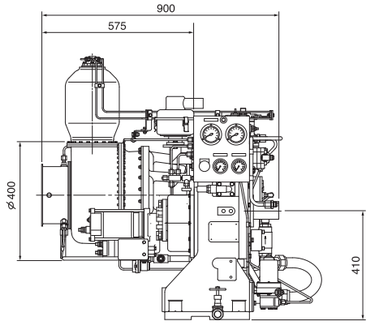
  2,942Pa(300mmAq)

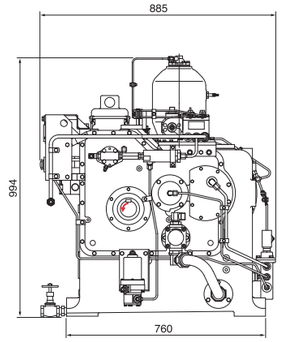


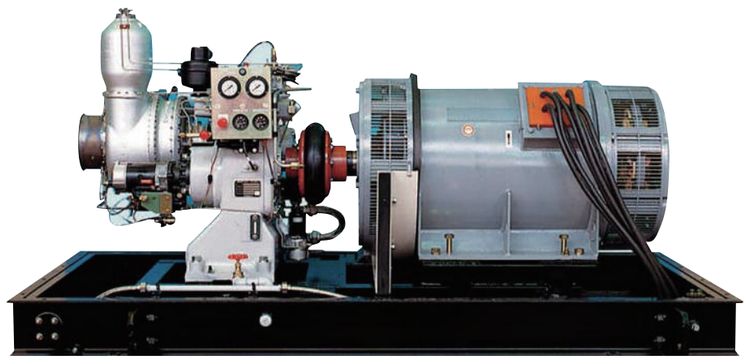



## S1A (01, 02, 03, 06)type gas turbine engine

- Total engine weight (S1A-01, 02, 03) : 430 kg (including output generating part weight of 100 kg)
- Total engine weight (S1A-06) : 530 kg (including output generating part weight of 120 kg)



# PS375/500/500S

## Standard performance

- Atmospheric pressure

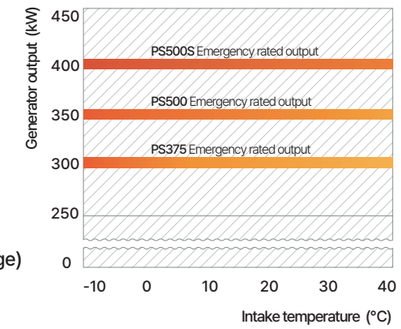
  99.6kPa(1,016kg/cm²)
  (equivalent to altitude of 150m)

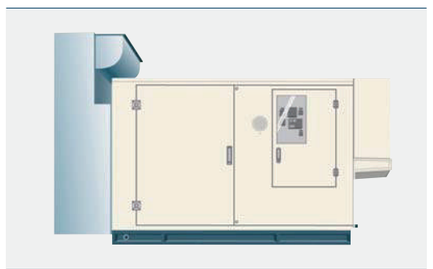
Air intake duct pressure loss

981Pa(100mmAq)

Exhaust duct pressure loss (voltage)

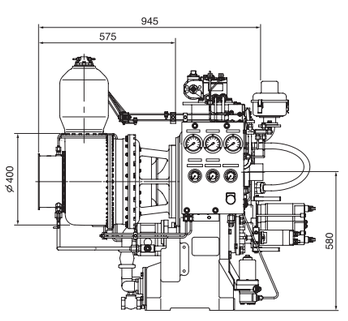
2,942Pa(300mmAq)

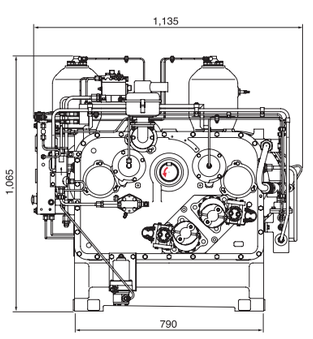


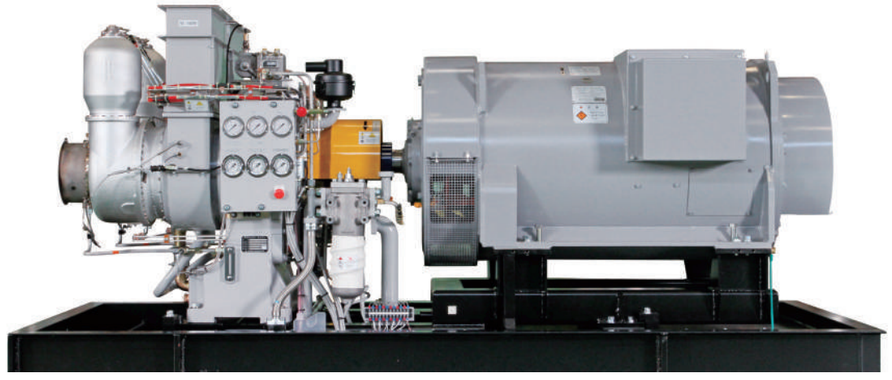



## S1T (02A, 02, 03)type gas turbine engine

- Total engine weight (S1A-01, 02, 03) : 640kg (including output generating part weight of 100 kg)



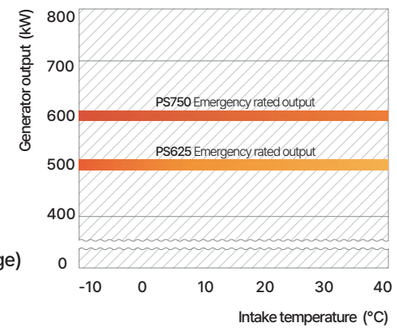



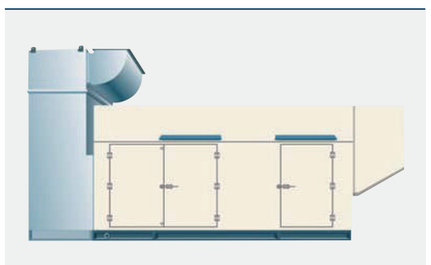



# PS625/750

## Standard performance

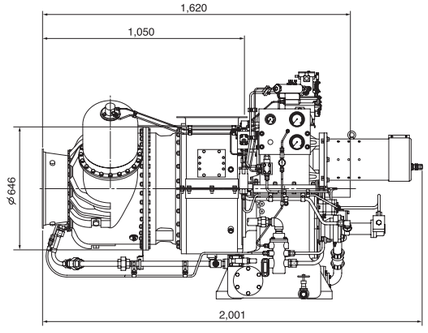
- Atmospheric pressure
  99.6kPa(1,016kg/cm²)
  (equivalent to altitude of 150m)
- Air intake duct pressure loss
  981Pa(100mmAq)
- Exhaust duct pressure loss(voltage)
  2,942Pa(300mmAq)

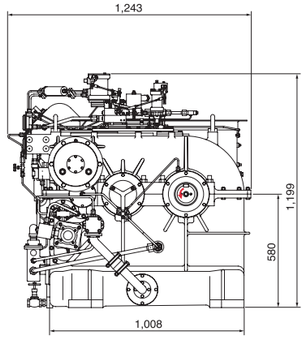


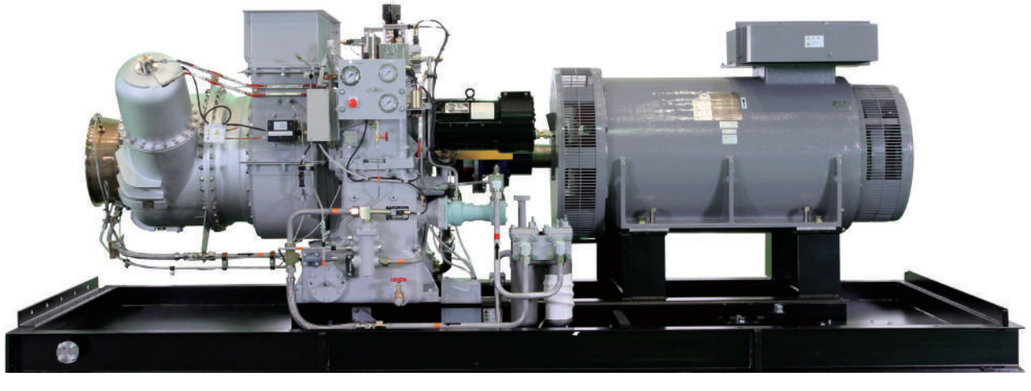



## S2A (01A,01)type gas turbine engine

- Total engine weight : 1,480kg (including output generating part weight of 480 kg)



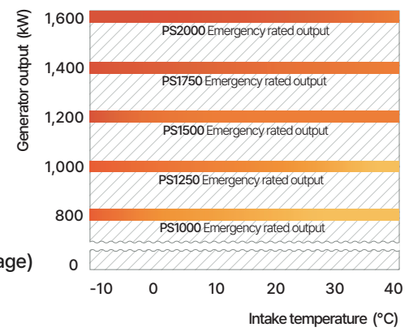



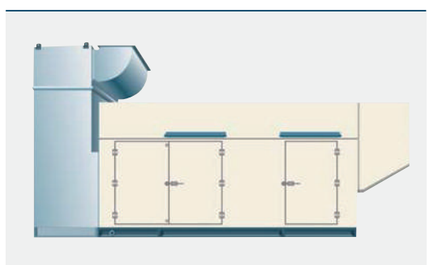



# PS1000/1250/1500/1750/2000

## Standard performance

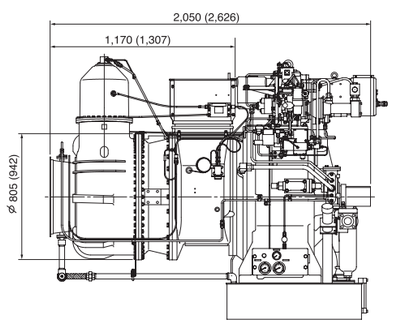
- Atmospheric pressure
  99.6kPa(1,016kg/cm²)
  (equivalent to altitude of 150m)
- Air intake duct pressure loss
  981Pa(100mmAq)
- Exhaust duct pressure loss(voltage)
  2,942Pa(300mmAq)

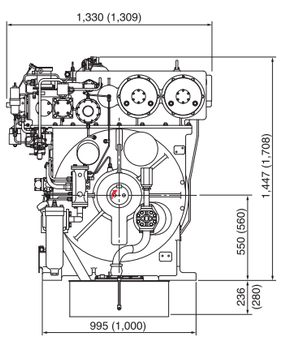


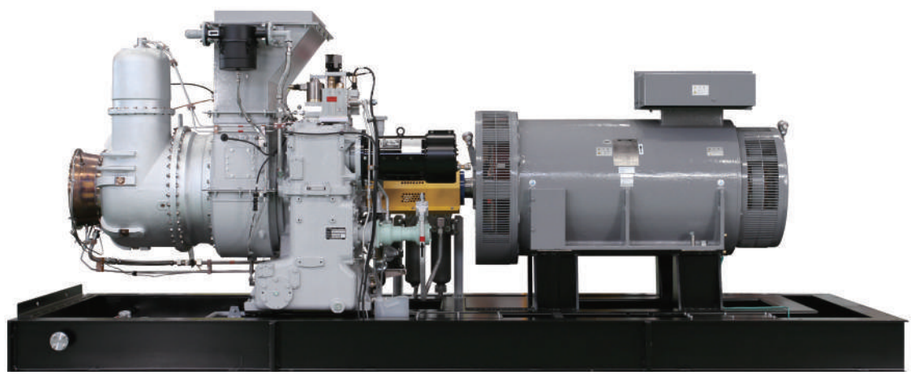
## M1A (01A, 01, 03, 06, 21)type gas turbine engine

- Total engine weight (M1A-01A,-01,-03,-06) : 3,020kg (including output generating part weight of 990 kg)
- Total engine weight (M1A-21) : 3,530kg (including output generating part weight of 1,290 kg)




* ( ) : M1A-21



# PS2500/3000/3500

## Standard performance

- Atmospheric pressure

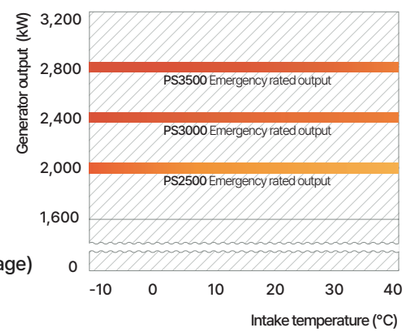
  99.6kPa(1,016kg/cm²)
  (equivalent to altitude of 150m)

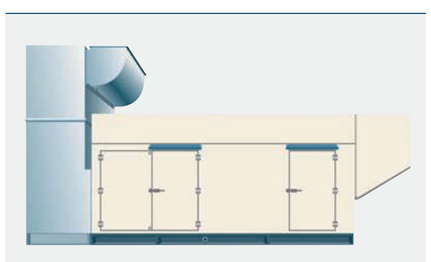
- Air intake duct pressure loss

  981Pa(100mmAq)

- Exhaust duct pressure loss(voltage)

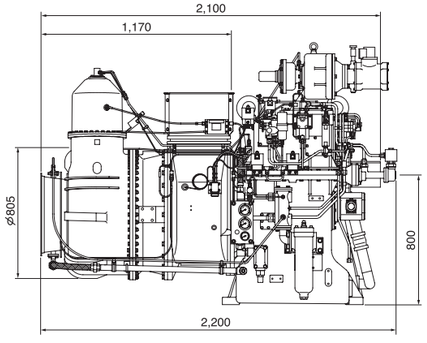
  2,942Pa(300mmAq)

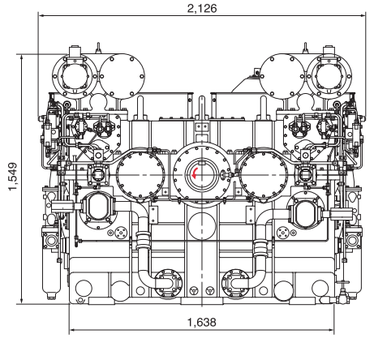


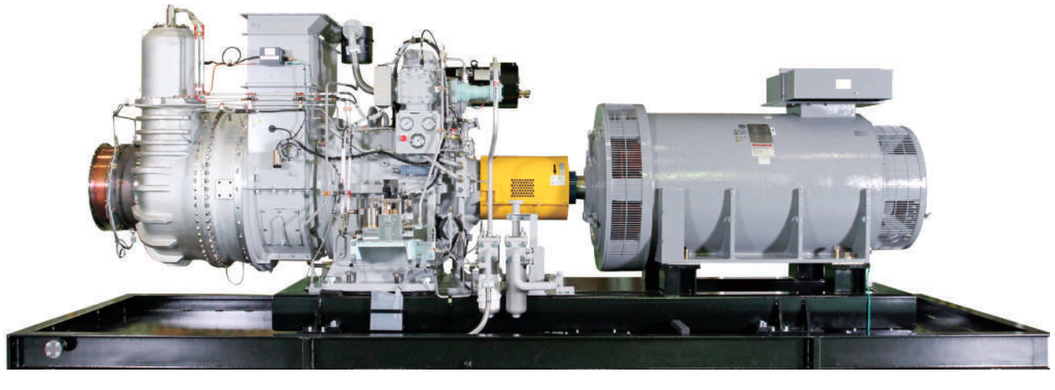



## M1T (01S, 03, 06)type gas turbine engine

- Total engine weight : 5,720kg (including output generating part weight of 990 kg x2)



# PS4000/4500

## Standard performance

- Atmospheric pressure

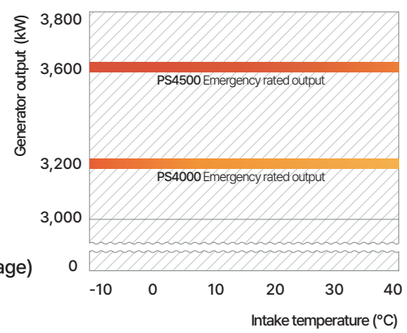
  99.6kPa(1,016kg/cm²)
  (equivalent to altitude of 150m)

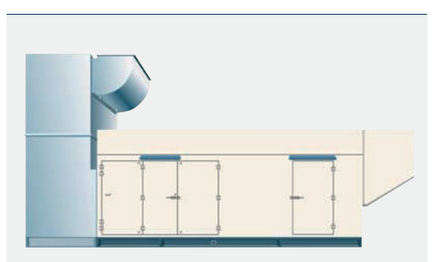
- Air intake duct pressure loss

  981Pa(100mmAq)

- Exhaust duct pressure loss(voltage)

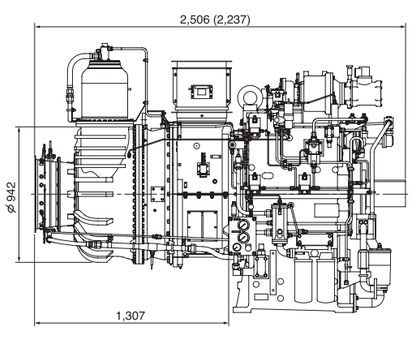
  2,942Pa(300mmAq)

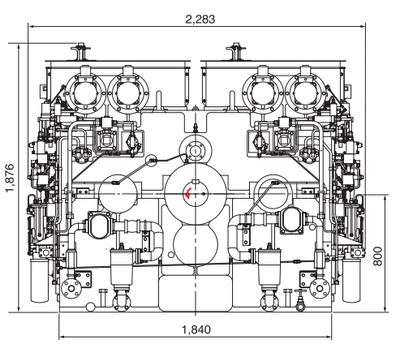


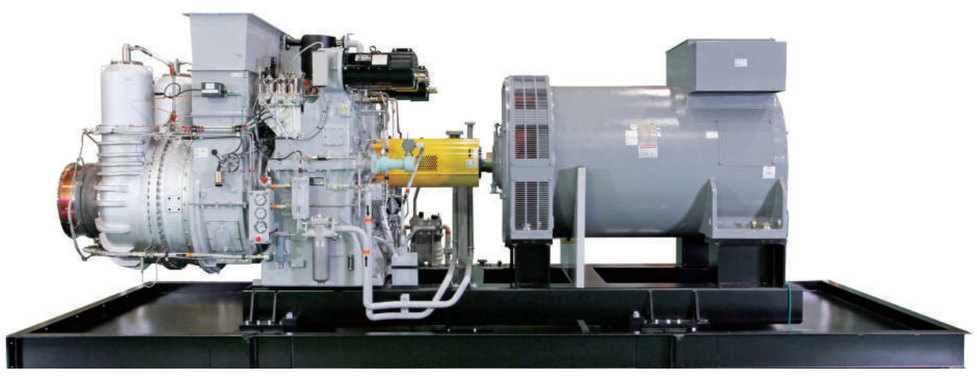
## M1T (21, 23S)type gas turbine engine

- Total engine weight (M1T-21) : 6,470kg (including output generating part weight of 1,290 kg ×2)
- Total engine weight (M1T-23S) : 7,700kg (including output generating part weight of 1,340 kg ×2)



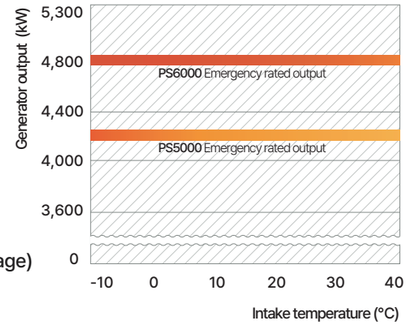

* ( ) : M1T-21

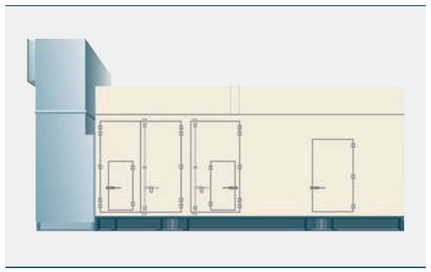


# PS5000/6000

## Standard performance

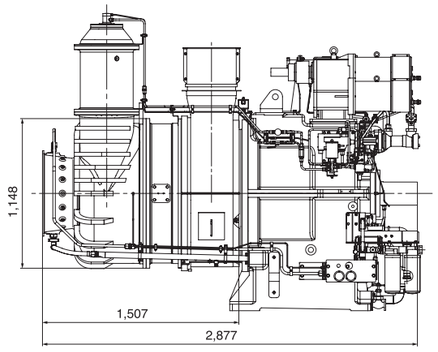
- Atmospheric pressure
  99.6kPa(1,016kg/cm²)
  (equivalent to altitude of 150m)
- Air intake duct pressure loss
  981Pa(100mmAq)
- Exhaust duct pressure loss(voltage)
  2,942Pa(300mmAq)

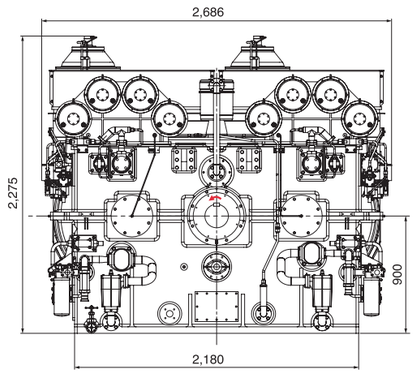


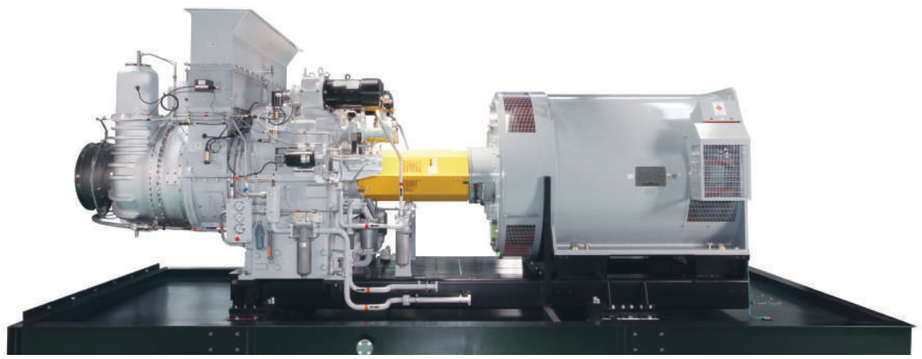



## M1T (26, 33)type gas turbine engine

- Total engine weight (M1T-26, 33) : 13,500kg (including output generating part weight of 2,540 kg x2)



# Special Specifications

## Minimum temperature of fuel and cold-region measures

There is a need to maintain the fuel piping, fuel tank, and filter in the generator set at an appropriate temperature depending on the fuel and ambient temperature.
For regions where the minimum temperature is lower than that shown in the table on the right, please consult with us.

| Fuel | Model | Ambient temperature (fuel tank, inside generator set) |
|---|---|---|
| Kerosene | All models | -25°C |
| Diesel | All models | -15°C |

## Starting battery and cold-region measures

* If the battery is used at temperatures within ( ), install a heater.
  For the dimensions of the starting battery panel and the specifications of the battery, please consult with us.

• **MSB :** Maintenance-free Sealed Battery

| Temperature \ Model | PS 200 | PS 250 | PS 250S | PS 300 | PS 375 | PS 500 | PS 500S | PS 625 | PS 750 | PS 1000 | PS 1250 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0°C or higher | MSB-24V-200AH | | | MSB-24V-400AH | | | | | | | |
| -5°C or higher | MSB-24V-300AH | | | MSB-24V-400AH | MSB-24V-500AH | | | MSB-48V-400AH | | MSB-60V-600AH | |
| -10°C or higher | | | | | | | | | | | |
| -15°C(-25°C)or higher | MSB-24V-400AH | | | | | | | | | | |

| Temperature \ Model | PS 1500 | PS 1750 | PS 2000 | PS 2500 | PS 3000 | PS 3500 | PS 4000 | PS 4500 | PS 5000 | PS 6000 |
|---|---|---|---|---|---|---|---|---|---|---|
| 0°C or higher | MSB-60V-600AH | | | MSB-60V-600AH x 2 | | | | MSB-60V-700AH x 2 | MSB-60V-800AH x 2 | MSB-60V-600AH x 4 |
| -5°C or higher | | | | | | | | | | |
| -10°C or higher | MSB-60V-700AH | | | MSB-60V-700AH x 2 | | | | MSB-60V-800AH x 2 | MSB-60V-900AH x 2 | MSB-60V-700AH x 4 |
| -15°C(-25°C)or higher | | | | | | | | | | |

## LOW - NOISE GENERATOR

- The standard noise of the gas turbine generator is 85 dB(A).
- The low-noise generator can be designed and manufactured 70dB(A).

# Emergency Generator Major Equipment Specifications

The major specifications of the “PS series” emergency power generator are shown in the table below.
All the output values are based on the following conditions: air intake duct loss of 981 Pa (100 mmAq), exhaust duct pressure loss of 2,942 Pa (300 mmAq), generator efficiency of 92-95%, and installation altitude of 150 m. If the ambient temperature or installation altitude is different from the above conditions, please consult with us.

| Item \ Model | | | PS200 | PS250 | PS250S | PS300 | PS375 | PS500 | PS500S | PS625 | PS750 | PS1000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Generator set | Rated output (kW)40°C | | 150 | 180 | 200 | 240 | 300 | 350 | 400 | 500 | 600 | 800 |
| | Ambient Temp. | | 5~40°C | | | | | | | | | |
| | Altitude | | 150m or less | | | | | | | | | |
| | Fuel | | Kerosene, Diesel | | | | | | | Kerosene, Diesel, LNG | | |
| | Start-up time | | Within 40 seconds | | | | | | | | | |
| | Load application capacity | | 100% (Resistive load) | | | | | | | | | |
| | Speed fluctuation rate | | 3±0.5% | | | | | | | | | |
| | Instantaneous speed fluctuation | | Within ±4% (full load application and disconnection) | | | | | | | Within ±4.5% | | |
| | Normal speed fluctuation rate | | Within ±0.3% | | | | | | | | | |
| | Fuel consumption (Diesel ℓ/h) | | 115 | 125 | 135 | 145 | 230 | 240 | 260 | 275 | 305 | 465 |
| Generator | Type | | Protected type (IP-21) | | | | | | | | | |
| | Rated output (kVA) 40°C | | 187.5 | 225 | 250 | 300 | 375 | 437.5 | 500 | 625 | 750 | 1000 |
| | Power factor | | 0.8 | | | | | | | | | |
| | Voltage (V) | | 380/220 ~6,600 | | | | | | | | | |
| | Frequency (Hz) | | 50/60 | | | | | | | | | |
| | Phase | | 3 | | | | | | | | | |
| | No. of poles | | 4 | | | | | | | | | |
| | Rotation speed (rpm) | | 1,500/1,800 | | | | | | | | | |
| | Excitation system | | AC exciter (Brushless mode) | | | | | | | | | |
| Gas turbine | Type | | S1A-01 | S1A-02 | S1A-03 | S1A-06 | S1T-02A | S1T-02 | S1T-03 | S2A-01A | S2A-01 | M1A-01A |
| | | | Simple open cycle, single shaft | | | | | | | | | |
| | Structure | Compressor | Two-stage, centrifugal type | | | | | | | | | |
| | | Combustor | Cylindrical (can type) | | | | | | | | | |
| | | Turbine | Two-stage axial | | | | | | | Three-stage axial | | |
| | Rated output 40°C | (kW) | 191 | 202 | 228 | 272 | 353 | 390 | 441 | 588 | 662 | 883 |
| | | (PS) | 260 | 275 | 310 | 370 | 480 | 530 | 600 | 800 | 900 | 1,200 |
| | Rotation speed (rpm) | | 53,000 | | | | | | | 31,500 | | 22,000 |
| | Lube oil | Kind | Synthetic oil (designated oil: SHELL ASTO-500, MOBIL JET II, CASTROL 5000, BP BPTO 2380) | | | | | | | | | |
| | | Capacity(ℓ) | 33 | | | 37 | 49 | | | 66 | | 100 |
| | | Consumption(ℓ/h) | 0.025 | | | | 0.05 | | | 0.08 | | |
| Reducer | | | Parallel shaft gear | | | | | | | | | Planetary gear |
| Speed | | | Electrical type | | | | | | | | | |
| Starting system | Electrical ※1 | | MSB-2V-200AH-12EA | | | MSB-2V-400AH-12EA | | | | MSB-2V-400AH-24EA | | |
| | Pneumatic (air tank and compressor) | | - | | | | | | | 1.5m³ x 2 3.7 kW x 1 | | 2.5m³ x 2 5.5 kW x 1 |
| Control | | | HSB-12V-130AH-2EA | | | | | | | | | |

| Item \ Model | | | PS1250 | PS1500 | PS1750 | PS2000 | PS2500 | PS3000 | PS3500 | PS4000 | PS4500 | PS5000 | PS6000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Generator set | Rated output (kW)40°C | | 1,000 | 1,200 | 1,400 | 1,600 | 2,000 | 2,400 | 2,800 | 3,200 | 3,600 | 4,000 | 4,800 |
| | Ambient Temp. | | 5~40°C | | | | | | | | | | |
| | Altitude | | 150m or less | | | | | | | | | | |
| | Fuel | | Kerosene, Diesel, LNG | | | | | | | | | | |
| | Start-up time | | Within 40 seconds | | | | | | | | | | |
| | Load application capacity | | 100% (Resistive load) | | | | | | | | | | |
| | Speed fluctuation rate | | 3±0.5% | | | | | | | | | | |
| | Instantaneous speed fluctuation | | Within ±4.5% | | | | | | | | | Within ±5% | |
| | Normal speed fluctuation rate | | Within ±0.3% | | | | | | | | | | |
| | Fuel consumption (Diesel ℓ/h) | | 525 | 620 | 695 | 695 | 1,065 | 1,245 | 1,385 | 1,390 | 1,525 | 1,835 | 2,050 |
| Generator | Type | | Protected type (IP-20) | | | | | | | | | | |
| | Rated output (kVA) 40°C | | 1,250 | 1,500 | 1,750 | 2,000 | 2,500 | 3,000 | 3,500 | 4,000 | 4,500 | 5,000 | 6,000 |
| | Power factor | | 0.8 | | | | | | | | | | |
| | Voltage (V) | | 380/220 ~6,600 | | | | | | | 3,300/6,600 | | | |
| | Frequency (Hz) | | 50/60 | | | | | | | | | | |
| | Phase | | 3 | | | | | | | | | | |
| | No. of poles | | 4 | | | | | | | | | | |
| | Rotation speed (rpm) | | 1,500/1,800 | | | | | | | | | | |
| | Excitation system | | AC exciter (Brushless mode) | | | | | | | | | | |
| Gas turbine | Type | | M1A-01 | M1A-03 | M1A-06 | M1A-21 | M1T-01S | M1T-03 | M1T-06 | M1T-21 | M1T-23S | M1T-26 | M1T-33 |
| | | | Simple open cycle, single shaft | | | | | | | | | | |
| | Structure | Compressor | Two-stage centrifugal type | | | | | | | | | | |
| | | Combustor | Cylindrical (can type) | | | | | | | | | | |
| | | Turbine | Three-stage axial | | | | | | | | Four-stage axial | | |
| | Rated output 40°C | (kW) | 1,118 | 1,368 | 1,567 | 1,765 | 2,317 | 2,663 | 3,089 | 3,457 | 3,898 | 4,347 | 5,200 |
| | | (PS) | 1,520 | 1,860 | 2,130 | 2,400 | 3,150 | 3,620 | 4,200 | 4,700 | 5,300 | 5,910 | 7,070 |
| | Rotation speed (rpm) | | 22,000 | | | | | | | | | | 18,000 |
| | Lube oil | Kind | Synthetic oil (designated oil: SHELL ASTO-500, MOBIL JET II, CASTROL 5000, BP BPTO 2380) | | | | | | | | | | |
| | | Capacity(ℓ) | 100 | | | 165 | 160 | | | | 240 | 370 | |
| | | Consumption(ℓ/h) | 0.08 | | | | 0.16 | | | | | 0.2 | |
| Reducer | | | Planetary gear | | | | Parallel shaft gear | | | Planetary gear + parallel shaft gear | | | |
| Speed | | | Electrica | | | | | | | | | | |
| Starting system | Electrical ※1 | | MSB-2V-600AH-30EA | | | MSB-2V-600AH-60EA | | | | | MSB-2V-700AH-30EA x 2 | MSB-2V-800AH-30EA x 2 | MSB-2V-600AH-30EA x 4 |
| | Pneumatic (air tank and compressor) | | 2.5m³ x 2 5.5k W x 1 | 3m³ x 2 5.5 kW 1 | | 5m³ x 2 5.5 kW x 2 | | 6m³ x 2 5.5 kW x 2 | 6m³ x 2 5.5 kW x 3 | 7m³ x 2 5.5kW x 3 | | | 6m³ x 6 5.5kW x 6 |
| Control | | | HSB-12V-130AH-2EA | | | | | | | | | | |

1. Fuel consumption is the standard value of diesel usage when rated output occurs at an ambient temperature of 15°C and an installation altitude of 150 m.
   The error range is 5% (6% for PS500S and below).
2. The starting system has the capacity to enable five consecutive starts.
3. If the $GD^2$ of the generator is large, the battery capacity and quantity may change, so please consult with us.
4. Since the models PS625 and above can also use gas fuel, please consult with us.

# Generator Set Specifications

| Item \ Model | PS200 | | PS250 | | PS250S | | PS300 | |
|---|---|---|---|---|---|---|---|---|
| | A-C | B-C | A-C | B-C | A-C | B-C | A-C | B-C |
| Generator Room Dimensions -Standard (m) | - | 5(L)×5(W)×4(H) | - | 5(L)×5(W)×4(H) | - | 5(L)×5(W)×4(H) | - | 5(L)×5(W)×4(H) |
| Generator Set Weight (kg) | 3,600 | | 3,600 | | 3,600 | | 4,000 | 3,800 |
| Generator Weight (kg) | 900 | | 900 | | 900 | | 900 | |
| Exhaust Silencer Weight (kg) | 705 | 510 | 705 | 510 | 705 | 510 | 705 | 510 |
| Fuel Consumption : Diesel (ℓ/h) | 115 | | 125 | | 135 | | 145 | |
| Fuel Consumption : LNG ($Nm^3/h$) | 92 | | 99 | | 107 | | 400 | 300 |
| Generator Set Noise Level dB(A) | Approx. 85 | | Approx. 85 | | Approx. 85 | | Approx. 85 | |
| Exhaust Silencer Noise Level dB(A) | Approx. 90 | | Approx. 90 | | Approx. 90 | | Approx. 85 | Approx. 90 |

| Item \ Model | PS375 | | PS500 | | PS500S | | PS625 | |
|---|---|---|---|---|---|---|---|---|
| | A-CR | B-ER | A-CR | B-ER | A-CR | B-ER | A-CR | B-ER |
| Generator Room Dimensions -Standard (m) | - | 5(L)×6.5(W)×4.5(H) | - | 5(L)×6.5(W)×4.6(H) | - | 5(L)×6.5(W)×4.7(H) | - | 6(L)×8(W)×4.5(H) |
| Generator Set Weight (kg) | 5,500 | | 5,500 | | 5,500 | | 8,650 | 8,500 |
| Generator Weight (kg) | 2,300 | | 2,300 | | 2,800 | | 3,000 | |
| Exhaust Silencer Weight (kg) | 1,140 | 980 | 1,140 | 980 | 1,140 | 980 | 1,440 | 1,180 |
| Fuel Consumption : Diesel (ℓ/h) | 230 | | 240 | | 260 | | 275 | |
| Fuel Consumption : LNG ($Nm^3/h$) | 184 | | 195 | | 210 | | 222 | |
| Generator Set Noise Level dB(A) | Approx.85 | | Approx.85 | | Approx. 85 | | Approx. 85 | |
| Exhaust Silencer Noise Level dB(A) | Approx.90 | | Approx. 90 | | Approx. 90 | | Approx. 90 | |

| Item \ Model | PS750 | | PS1000 | | PS1250 | | PS1500 | |
|---|---|---|---|---|---|---|---|---|
| | A-CR | B-ER | A-CR | B-ER | A-CR | B-ER | A-CR | B-ER |
| Generator Room Dimensions -Standard (m) | - | 6(L)×8(W)×4.5(H) | - | 8(L)×9.5(W)×5(H) | - | 8(L)×9.5(W)×5(H) | - | 8(L)×9.5(W)×5(H) |
| Generator Set Weight (kg) | 8,650 | 8,500 | 13,000 | 12,500 | 13,500 | 13,000 | 14,500 | 14,000 |
| Generator Weight (kg) | 3,000 | | 3,500 | | 4,000 | | 5,000 | |
| Exhaust Silencer Weight (kg) | 1,440 | 1,180 | 2,370 | 1,720 | 2,370 | 1,720 | 2,370 | 1,720 |
| Fuel Consumption : Diesel (ℓ/h) | 305 | | 465 | | 525 | | 620 | |
| Fuel Consumption : LNG ($Nm^3/h$) | 245 | | 375 | | 425 | | 497 | |
| Generator Set Noise Level dB(A) | Approx. 85 | | Approx. 85 | | Approx. 85 | | Approx. 85 | |
| Exhaust Silencer Noise Level dB(A) | Approx. 90 | | Approx. 90 | | Approx. 90 | | Approx. 90 | |

* 1. The generator set weight includes the generator weight.
2. Because noise levels are measured in relatively open outdoor spaces, they may be lower.
3. Fuel consumption is based on conditions where the rated output can be generated at an ambient temperature of 15°C and an installation altitude of 150 m.
The error is approximately 5% (up to 6% for PS500S and below).

| Item \ Model | PS1750 | | PS2000 | | PS2500 | |
|---|---|---|---|---|---|---|
| | A-CR | B-ER | A-CR | B-ER | A-CR | B-ER |
| Generator Room Dimensions -Standard (m) | - | 5(L)×5(W)×4(H) | - | 13(L)×8.5(W)×5.5(H) | - | 13(L)×8.5(W)×5.5(H) |
| Generator Set Weight (kg) | 6,000 | 15,500 | 21,500 | 21,000 | 22,000 | 21,500 |
| Generator Weight (kg) | 5,500 | | 6,500 | | 7,000 | |
| Exhaust Silencer Weight (kg) | 2,370 | 1,750 | 3,950 | 3,250 | 3,950 | 3,250 |
| Fuel Consumption : Diesel (ℓ/h) | 695 | | 695 | | 1,065 | |
| Fuel Consumption : LNG ($Nm^3/h$) | 574 | | 750 | | 868 | |
| Generator Set Noise Level dB(A) | Approx. 85 | | Approx. 85 | | Approx. 85 | |
| Exhaust Silencer Noise Level dB(A) | Approx. 90 | | Approx. 90 | | Approx. 90 | |

| Item \ Model | PS3000 | | PS3500 | PS4000 |
|---|---|---|---|---|
| | A-CR | B-ER | B-ER | B-ER |
| Generator Room Dimensions -Standard (m) | - | 15(L)×10(W)×6(H) | 15(L)×10(W)×6(H) | 15(L)×10(W)×6(H) |
| Generator Set Weight (kg) | 23,500 | 23,000 | 23,000 | 34,500 |
| Generator Weight (kg) | 8,000 | | 9,000 | 10,000 |
| Exhaust Silencer Weight (kg) | 4,700 | 3,250 | 3,250 | 3,900 |
| Fuel Consumption : Diesel (ℓ/h) | 1,245 | | 1,385 | 1,390 |
| Fuel Consumption : LNG ($Nm^3/h$) | 1,006 | | 1,163 | 1,121 |
| Generator Set Noise Level dB(A) | Approx. 85 | | Approx. 85 | Approx. 85 |
| Exhaust Silencer Noise Level dB(A) | Approx. 90 | | Approx. 90 | Approx. 90 |

| Item \ Model | PS4500 | PS5000 | PS6000 |
|---|---|---|---|
| | B-ER | B-ER | B-ER |
| Generator Room Dimensions -Standard (m) | 15(L)×10(W)×6(H) | 17(L)×10(W)×7.5(H) | 17(L)×10(W)×7.5(H) |
| Generator Set Weight (kg) | 35,500 | 41,650 | 44,100 |
| Generator Weight (kg) | 11,000 | 9,000 | 9,500 |
| Exhaust Silencer Weight (kg) | 3,900 | 5,100 | 5,100 |
| Fuel Consumption : Diesel (ℓ/h) | 1,525 | 1,835 | 2,050 |
| Fuel Consumption : LNG ($Nm^3/h$) | 1,228 | 1,496 | 1,672 |
| Generator Set Noise Level dB(A) | Approx. 85 | Approx. 85 | Approx. 85 |
| Exhaust Silencer Noise Level dB(A) | Approx. 90 | Approx. 90 | Approx. 90 |

* 4. Kerosene density : 0.78 g/$cm^3$ LHV : 10,300 kcal/kg (43,100 kJ/kg)
Diesel density : 0.83 g/$cm^3$ LHV : 10,200 kcal/kg (42,700 kJ/kg)
LNG density : 0.711 kg/$m^3$ LHV : 9,520 kcal/$Nm^3$

## Limiting moment of inertia of generator (KG·$M^2$)

* Values in ( ) indicate $GD^2$ (kgf $m^2$)

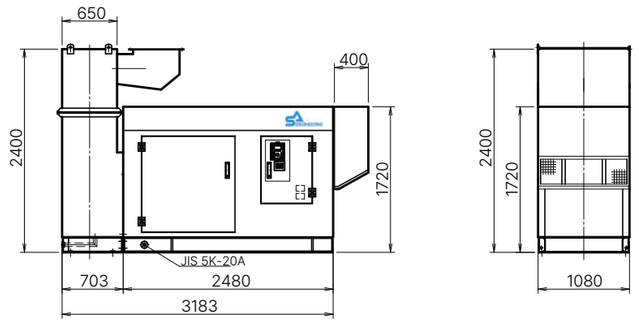
| Model | PS 200 | PS 250 | PS 250S | PS 300 | PS 375 | PS 500 | PS 500S | PS 625 | PS 750 | PS 1000 | PS 1250 | PS 1500 | PS 1750 | PS 2000 | PS 2500 | PS 3000 | PS 3500 | PS 4000 | PS 4500 | PS 5000 | PS 6000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,500min$^{-1}$ | 7.5 (30) | 8.7 (35) | 10.0 (40) | 10.0 (40) | 15.0 (60) | 17.5 (70) | 22.5 (90) | 30.0 (120) | 32.5 (130) | 47.5 (190) | 57.5 (230) | 67.5 (270) | 80.0 (320) | 90.0 (360) | 105.0 (420) | 115.0 (460) | 162.5 (650) | 187.5 (750) | 197.5 (790) | 212.5 (850) | |
| 1,800min$^{-1}$ | 7.2 (29) | 7.2 (29) | 7.5 (30) | 7.0 (28) | 12.5 (50) | 16.2 (65) | 21.2 (85) | 27.5 (110) | 30.0 (120) | 45.0 (180) | 51.2 (205) | 62.5 (250) | 55.0 (220) | 80.0 (320) | 105.0 (420) | 107.5 (430) | 112.5 (450) | 130.0 (520) | 137.5 (550) | 147.5 (590) | |

# Standard Equipment Dimensions

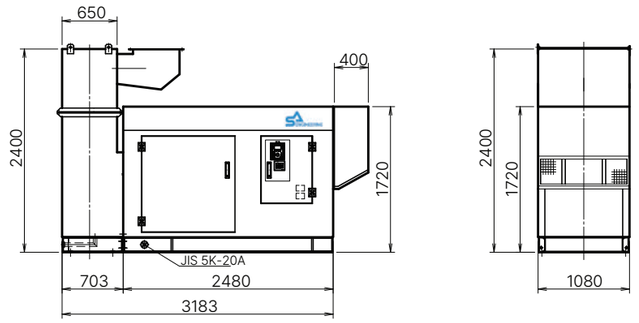
## PS200 / 250 / 250S (for low voltage)

※ All dimensions are in millimeters.

A-C
(Outdoor type)



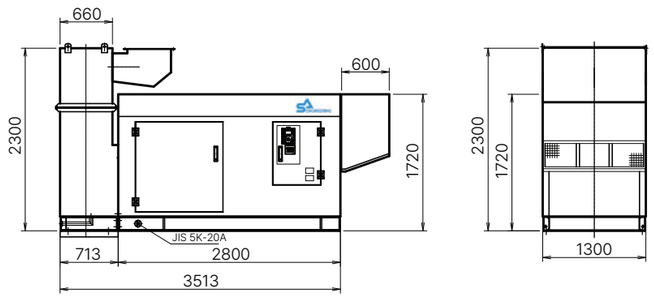

B-C
(Indoor type)



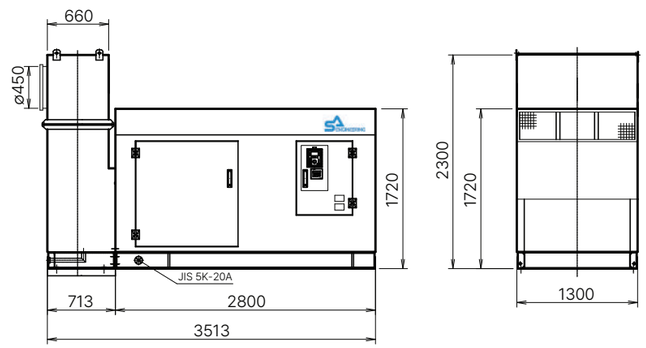

## PS300 (for low voltage)

※ All dimensions are in millimeters.

A-C
(Outdoor type)




B-C
(Indoor type)

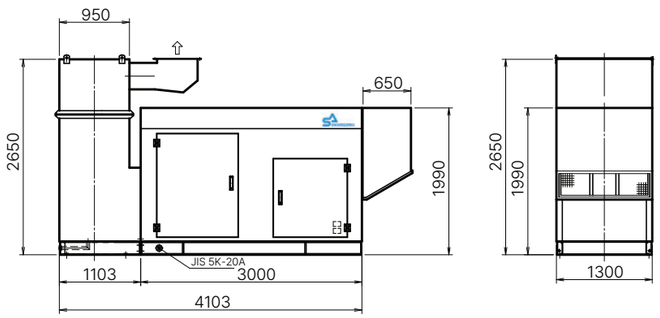




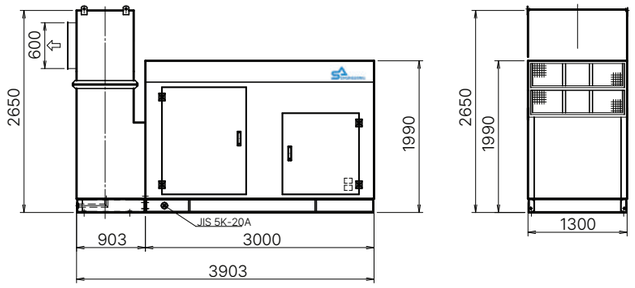

## PS375 / 500/ 500S

※ All dimensions are in millimeters.

A-CR
(Outdoor type)



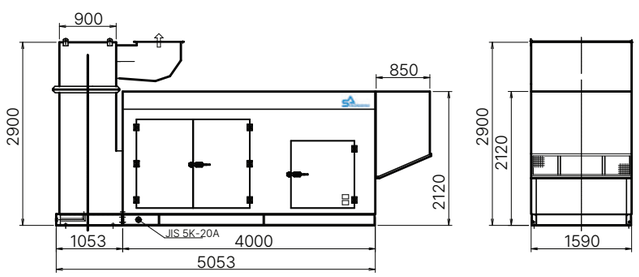

B-ER
(Indoor type)



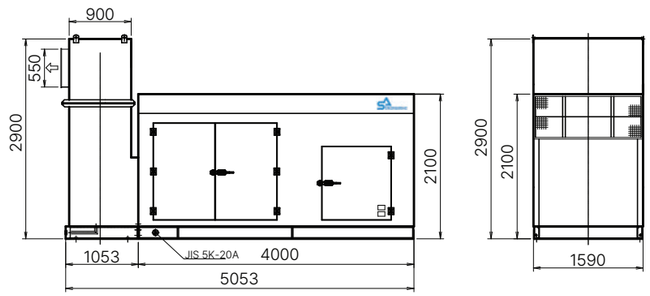

## PS625 / 750

※ All dimensions are in millimeters.

A-CR
(Outdoor type)




B-ER
(Indoor type)

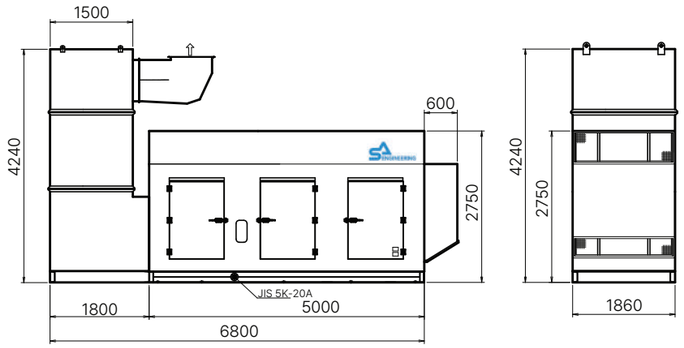


# Standard Equipment Dimensions

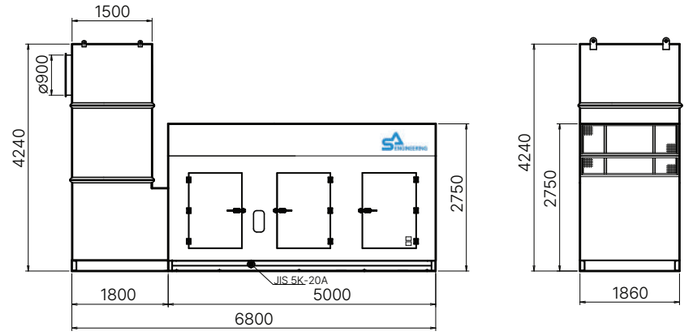
## PS1000 / 1250 / 1500 / 1750

※ All dimensions are in millimeters.

A-CR
(Outdoor type)



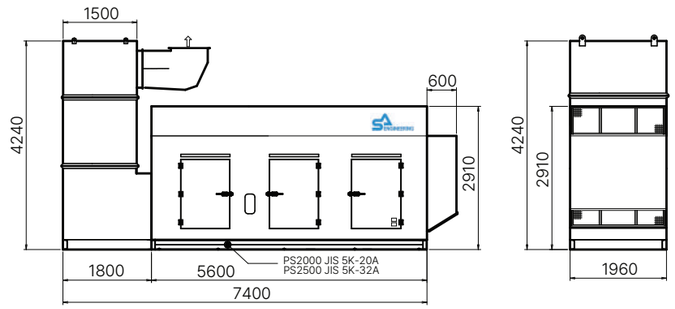

B-ER
(Indoor type)



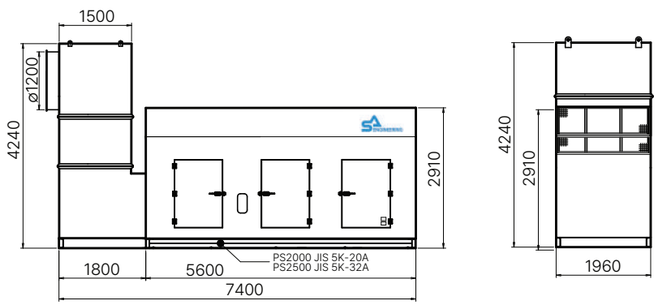

## PS2000 / 2500

※ All dimensions are in millimeters.

A-CR
(Outdoor type)




B-ER
(Indoor type)

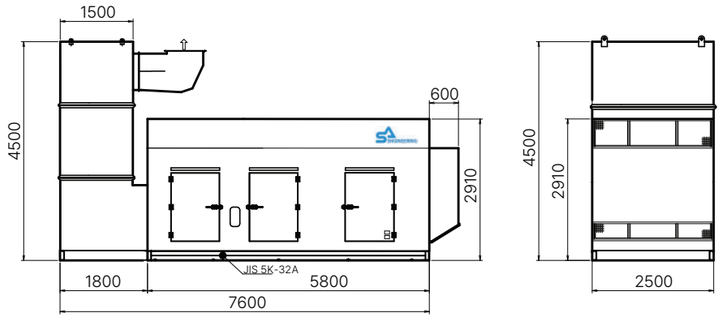




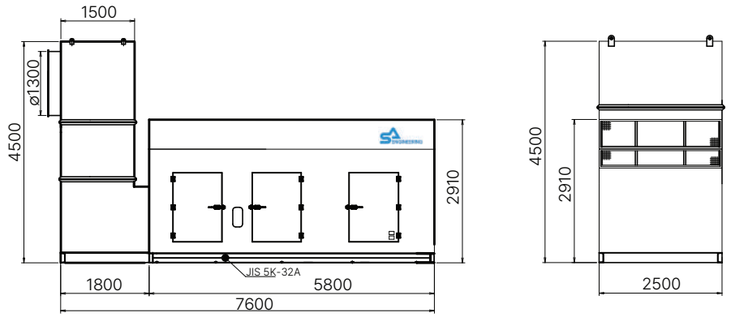

## PS3000 / 3500

※ All dimensions are in millimeters.

A-CR
(Outdoor type)



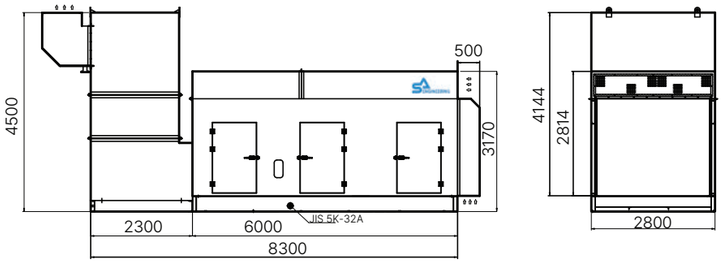

B-ER
(Indoor type)



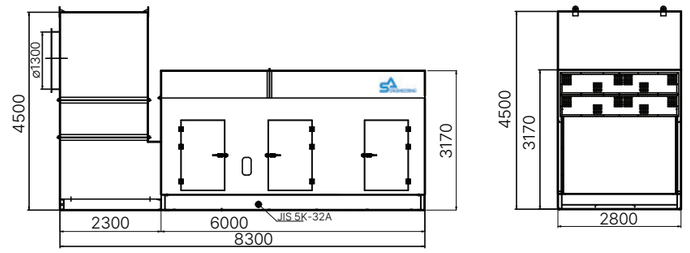

## PS4000 / 4500

※ All dimensions are in millimeters.

A-CR
(Outdoor type)




B-ER
(Indoor type)

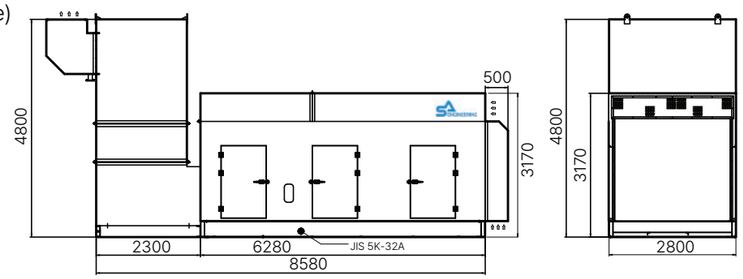


# Standard Equipment Dimensions

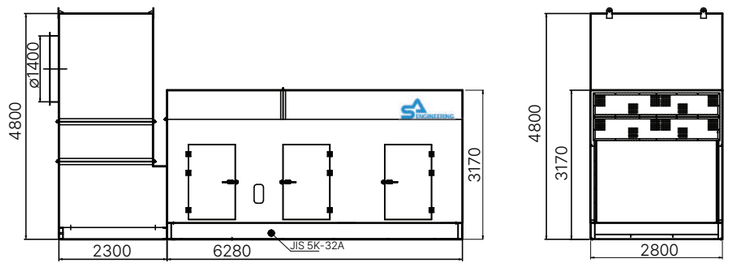
## PS5000

※ All dimensions are in millimeters.

A-CR
(Outdoor type)



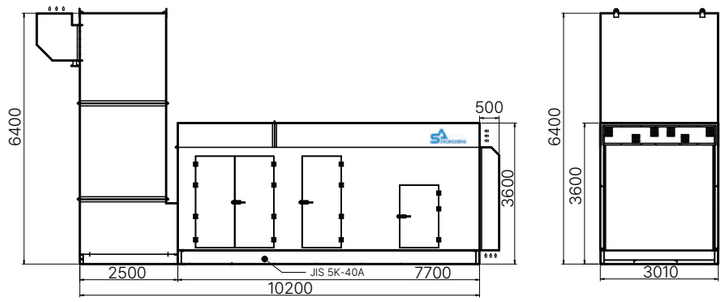

B-ER
(Indoor type)



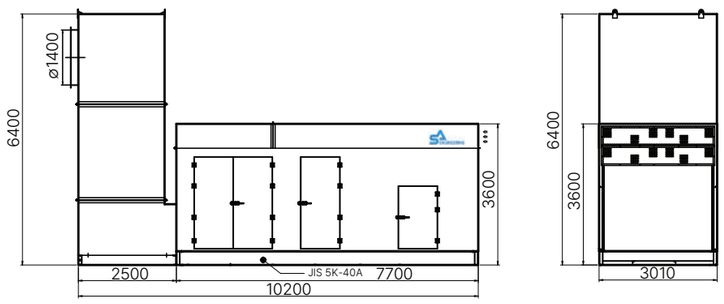

## PS6000

※ All dimensions are in millimeters.

A-CR
(Outdoor type)




B-ER
(Indoor type)

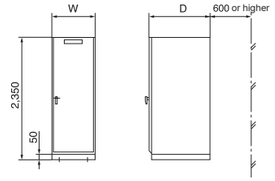




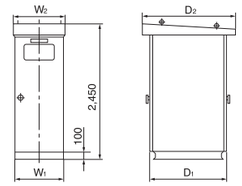



# Control Panel / Circuit Breaker Panel

Indoor type Front view Side view Rear space



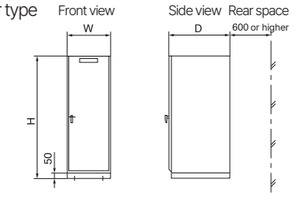

Outdoor type Front view Side view



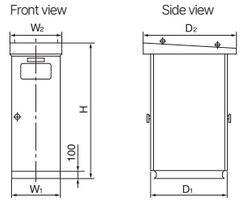

| | Type (standard voltage) | | Indoor type | | | | Outdoor type | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | W(mm) | D(mm) | H(mm) | Weight(kg) | $W_1$(mm) | $W_2$(mm) | $D_1$(mm) | $D_2$(mm) | H(mm) | Weight(kg) |
| Control panel and circuit breaker panel - Integrated | PS 200/250/250S | Low | 900 | 1,200 | 2,350 | 600 | 1,000 | 1,040 | 1,200 | 1,500 | 2,450 | 750 |
| | | High | 900 | 1,800 | 2,350 | 900 | 1,000 | 1,040 | 2,000 | 2,300 | 2,450 | 1,050 |
| | PS 300/375 | Low | 900 | 1,400 | 2,350 | 700 | 1,000 | 1,040 | 1,400 | 1,700 | 2,450 | 850 |
| | | High | 900 | 2,000 | 2,350 | 900 | 1,000 | 1,040 | 2,000 | 2,300 | 2,450 | 1,050 |
| | PS 500/500S | Low | 900 | 2,000 | 2,350 | 1,000 | 1,000 | 1,040 | 2,000 | 2,300 | 2,450 | 1,050 |
| | | High | 900 | 2,000 | 2,350 | | 1,000 | 1,040 | 2,000 | 2,300 | 2,450 | |
| | PS 625/750 | Low | 900 | 2,000 | 2,350 | 900 | 1,000 | 1,040 | 2,000 | 2,300 | 2,450 | 1,050 |
| | | High | 900 | 2,000 | 2,350 | | 1,000 | 1,040 | 2,000 | 2,300 | 2,450 | |
| Control panel and circuit breaker panel - Separate | PS 1000/1250/1500/1750 | Low | 900×2 | 2,000 | 2,350 | 1,100 | 1,000 | 1,040 | 2,000 | 2,300 | 2,450 | 1,250 |
| | | High | 900×2 | 2,000 | 2,350 | | 1,000 | 1,040 | 2,000 | 2,300 | 2,450 | |
| | PS 2000/2500/3000 | Low | 900×2 | 2,000 | 2,350 | 1,450 | 1,000 | 1,040 | 2,000 | 2,300 | 2,450 | 1,650 |
| | | High | 900×2 | 2,000 | 2,350 | | 1,000 | 1,040 | 2,000 | 2,300 | 2,450 | |
| | PS 3500/4000/4500 | High | 900×2 | 2,000 | 2,350 | 1600 | 1,000 | 1,040 | 2,000 | 2,300 | 2,450 | 1,800 |
| | | | | | | | 1,000 | 1,040 | | | | |
| | PS 5000/6000 | High | 1,000×2 | 2,000 | 2,350 | 1600 | 1,000 | 1,040 | 2,000 | 2,300 | 2,450 | 1,800 |
| | | | | | | | 1,000 | 1,040 | | | | |

# Starting Battery Panel

Indoor type Front view Side view Rear space



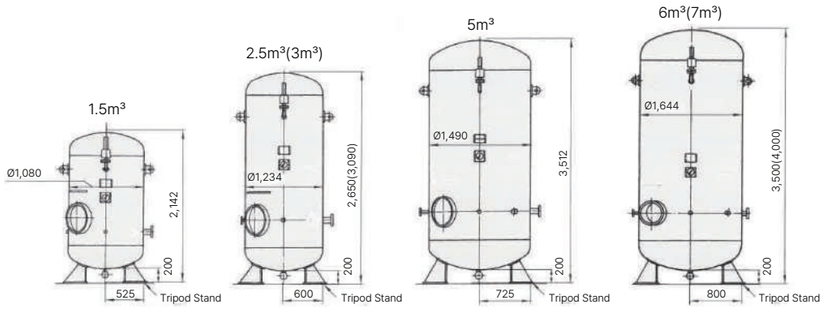

Outdoor type Front view Side view




| Type | Standard capacity | Indoor type | | | | Outdoor type | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | W(mm) | D(mm) | H(mm) | Weight(kg) | $W_1$(mm) | $W_2$(mm) | $D_1$(mm) | $D_2$(mm) | H(mm) | Weight(kg) |
| PS 200/250/250S | MSB-24V-200AH (2V 12EA) | 1,000 | 1,200 | 2,350 | 650 | 1,000 | 1,040 | 1,800 | 2,100 | 2,350 | 650 |
| | | 1,000 | 1,800 | 2,350 | | 1,000 | 1,040 | 1,800 | 2,100 | 2,350 | |
| PS 300 | MSB-24V-400AH (2V 12EA) | 1,000 | 1,800 | 2,350 | 800 | 1,000 | 1,040 | 1,800 | 2,100 | 2,350 | 800 |
| | | 1,000 | 2,000 | 2,350 | | 1,000 | 1,040 | 2,000 | 2,350 | 2,350 | |
| PS 375 | MSB-24V-400AH (2V 12EA) | 1,000 | 1,400 | 2,350 | 750 | 1,000 | 1,040 | 1,400 | 1,700 | 2,350 | 750 |
| | | 1,000 | 2,000 | 2,350 | | 1,000 | 1,040 | 2,000 | 2,300 | 2,350 | |
| PS 500/500S | MSB-24V-400AH(2V 12EA) | 1,000 | 2,000 | 2,350 | 900 | 1,000 | 1,040 | 2,000 | 2,300 | 2,350 | 1,000 |
| PS 625/750/1000 | MSB-48V-400AH(2V 24EA) | 1,000 | 2,000 | 2,350 | 1,250 | 1,000 | 1,040 | 2,000 | 2,300 | 2,350 | 1,350 |
| PS 1250 | MSB-60V-600AH(2V 30EA) | 1,000 | 2,000 | 2,350 | 1,900 | 1,000 | 1,040 | 2,000 | 2,300 | 2,350 | 2,000 |
| PS 1500/1750/2000 | MSB-60V-600AH(2V 30EA) | 1,000 | 2,000 | 2,350 | 1,900 | 1,000 | 1,040 | 2,000 | 2,300 | 2,350 | 2,000 |
| PS 2500 | MSB-60V-600AH X2(2V 30EA x 2set) | 1,000×2 | 2,000 | 2,350 | 1,900×2 | 1,000×2 | 2,040 | 2,000 | 2,300 | 2,350 | 2,000×2 |
| PS 3000/3500 | MSB-60V-600AH X2(2V 30EA x 2set) | 1,000×2 | 2,000 | 2,350 | 1,900×2 | 1,000×2 | 2,040 | 2,000 | 2,300 | 2,350 | 2,000×2 |
| PS 4000 | MSB-60V-600AH x2(2V 30EA x 2set) | 1,000×2 | 2,000 | 2,350 | 1,900×2 | 1,000×2 | 2,040 | 2,000 | 2,300 | 2,350 | 2,000×2 |
| PS 4500 | MSB-60V-700AH x2(2V 30EA x 2set) | 1,000×2 | 2,000 | 2,350 | 2,200×2 | 1,000×2 | 2,040 | 2,000 | 2,300 | 2,350 | 2,300×2 |
| PS 5000 | MSB-60V-800AH x2(2V 30EA x 2set) | 1,000×2 | 2,000 | 2,350 | 2,400×2 | 1,000×2 | 2,040 | 2,000 | 2,300 | 2,350 | 2,500×2 |
| PS 6000 | MSB-60V-600AH x4(2V 30EA x 4set) | 1,000×4 | 2,000 | 2,350 | 1,900×4 | 1,000×4 | 4,040 | 2,000 | 2,300 | 2,350 | 2,000×4 |

# Air Starter

## Air tank



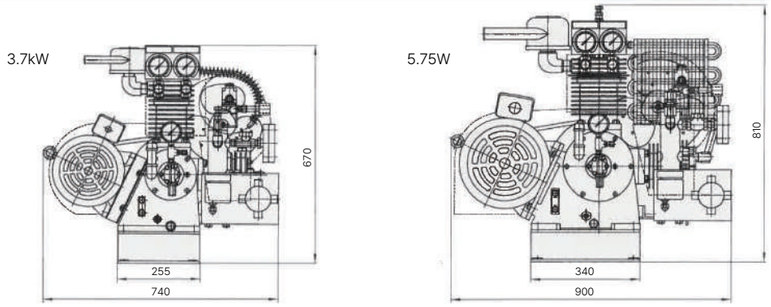

Weight: Approx. 1,300kg

Weight: Approx. 1,900kg
(Approx. 2,150kg)
Note: ( ) is for 3m³ type.

Weight: Approx. 3,915kg
(Approx. 3,400kg)
Note: ( ) is for 5.5m³ type.

Weight: Approx. 3,650kg

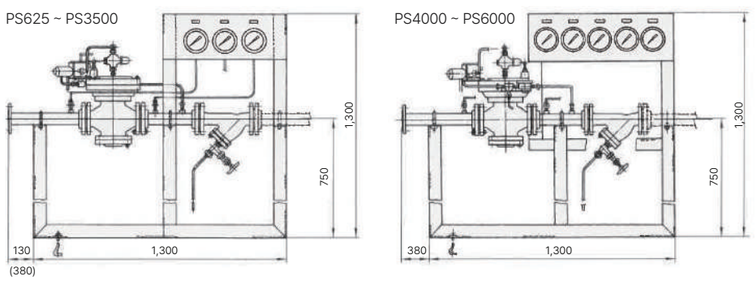
## Air compressor 11 kW




Weight: Approx. 130kg

Weight: Approx. 230kg

## Starting valve unit




Weight: Approx. 1,900kg
(Approx. 2,150kg)
The dimensions in ( ) apply to PS2000 - PS3500.

Weight: Approx. 350kg

| | PS 625 | PS 750 | PS 1000 | PS 1250 | PS 1500 | PS 1750 | PS 2000 | PS 2500 | PS 3000 | PS 3500 | PS 4000 | PS 4500 | PS 5000 | PS 6000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Air Tank | 1.5m³×2 | | 2.5m³×2 | | | 3m³×2 | 5m³×2 | | | 6m³×2 | 5.5m³×3 | 6m³×3 | 6m³×6 | |
| Air Compressor | 3.7kW×1 | | 5.5kW×1 | | | | 5.5kW×2 | | | | 5.5kW×3 | | | 5.5kW×6 |

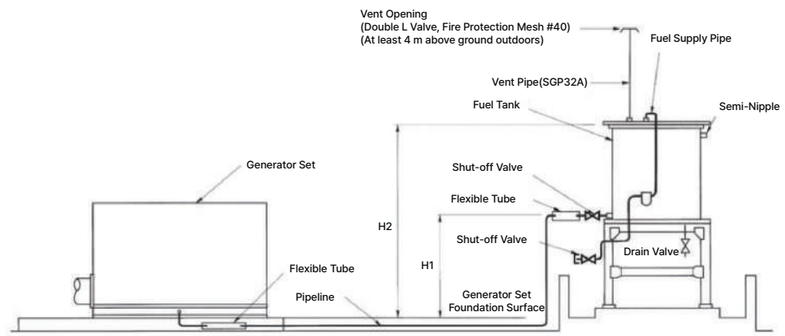
* The service pressure of an air tank and an air compressor is 30 kg/cm²G (2.9 MPa).

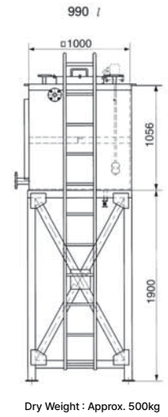




# Fuel tank

## Fuel piping system diagram




Dry Weight : Approx. 500kg

| | PS 200 | PS 250 | PS 250S | PS 300 | PS 375 | PS 500 | PS 500S | PS 625 | PS 750 | PS 1000 | PS 1250 | PS 1500 | PS 1750 | PS 2000 | PS 2500 | PS 3000 | PS 3500 | PS 4000 | PS 4500 | PS 5000 | PS 6000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Height $H_1$(mm) | 1,200 or higher | | | 1,250 or higher | | | 1,450 or higher | | 1,700 or higher | | | | | | | | | | | 2,300 or higher | |
| Height $H_2$(mm) | 4,200 or less | | | 4,050 or less | | | 4,150 or less | | 5,000 or less | | | | | 4,900 or less | | | | 5,000 or less | | 5,500 or less | |
| Pipeline | SGP 15A | | | SGP 20A | | | | | | | | | | SGP 32A | | | | | | SGP 40A | |
| Fuel supply pipe | SGP 32A | | | | | | | | | | | | | | | | | | | | |

# Gas Turbine Structure

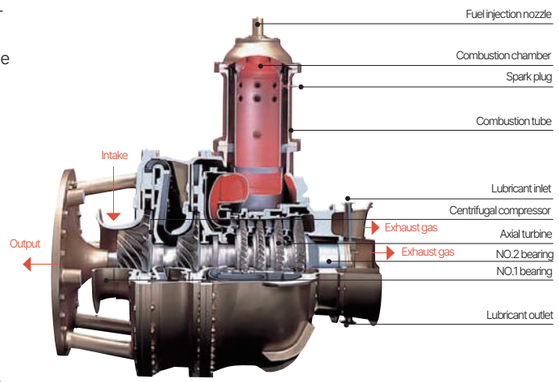
## Structure

The gas turbine applied by our company combines a centrifugal compressor and an axial turbine type with a cylindrical (can type) combustor. Its output shaft is directly connected to the reducer at the front of the engine (intake side). The compressor has a simple structure and can obtain a high compression ratio by using a high-performance centrifugal impeller. Because the combustor is a cylindrical type located on the outer side of the turbine and the side of the case, it is easy to maintain.

## Operation

While gas turbines are internal combustion engines like diesel engines or gasoline engines, the cycle of intake, compression, combustion, (expansion), and exhaust takes place continuously and at the same time. The basic movement of piston engines is the reciprocating linear motion of pistons, whereas gas turbines have a significant difference in that they perform rotational motion without any linear movement.

The basic principle of a gas turbine involves taking in and compressing air through the compressor, mixing this compressed air with fuel in the combustion chamber, and then generating high-temperature and high-pressure gas through the combustion process. The rotating force is generated as this gas passes through the turbine (impeller with multiple blades attached to a disc), and this rotating force transmits power to the compressor and output shaft of the previous stage.



# Air Supply, Ventilation, and Exhaust Volume

The intake air volume, exhaust volume, and ventilation air volume indicated here are for emergency purposes only. If it is for commercial purposes, please consult with us.

## Air supply volume

Wi = V1 + V2 + V3

V1 = air volume for gas turbine combustion

V2 = air volume for cooling oil cooler

V3 = air volume for cooling generator

| | PS 200 | PS 250 | PS 250S | PS 300 | PS 375 | PS 500 | PS 500S | PS 625 | PS 750 | PS 1000 | PS 1250 | PS 1500 | PS 1750 | PS 2000 | PS 2500 | PS 3000 | PS 3500 | PS 4000 | PS 4500 | PS 5000 | PS 6000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $V_1$(m³/min) | 95 | 95 | 95 | 95 | 185 | 185 | 185 | 240 | 240 | 320 | 400 | 440 | 440 | 450 | 525 | 880 | 880 | 900 | 900 | 1,050 | 1,400 |
| $V_2$(m³/min) | 30 | 35 | 35 | 35 | 65 | 65 | 65 | 65 | 65 | 50 | 70 | 70 | 75 | 140 | 200 | 200 | 200 | 200 | 200 | 300 | 400 |
| $V_3$(m³/min) | 40 | 45 | 50 | 60 | 70 | 80 | 90 | 110 | 120 | 140 | 145 | 170 | 200 | 230 | 265 | 320 | 340 | 400 | 410 | 450 | 500 |
| Wi(m³/min) | 165 | 175 | 180 | 190 | 320 | 330 | 340 | 415 | 425 | 510 | 615 | 680 | 715 | 820 | 990 | 1,400 | 1,420 | 1,500 | 1,510 | 1,800 | 2,300 |

* 1. The values above are for when the rated output is generated at an intake temperature of 40°C.
  2. The air volume for cooling the generator may vary depending on the generator specifications.

## Ventilation volume

| | PS 200 | PS 250 | PS 250S | PS 300 | PS 375 | PS 500 | PS 500S | PS 625 | PS 750 | PS 1000 | PS 1250 | PS 1500 | PS 1750 | PS 2000 | PS 2500 | PS 3000 | PS 3500 | PS 4000 | PS 4500 | PS 5000 | PS 6000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Wo(m³/min) | 76 | 86 | 91 | 120 | 145 | 166 | 166 | 188 | 208 | 228 | 235 | 262 | 299 | 517 | 541 | 588 | 650 | 682 | 768 | 1,000 | 1,050 |

* 1. The ventilation volume above plays the role of ventilating the heat generated inside an enclosure. If the silencer is not insulated, please consult with us.

## Exhaust volume

·Exhaust volume in the case of forced ventilation method

| | PS 200 | PS 250 | PS 250S | PS 300 | PS 375 | PS 500 | PS 500S | PS 625 | PS 750 | PS 1000 | PS 1250 | PS 1500 | PS 1750 | PS 2000 | PS 2500 | PS 3000 | PS 3500 | PS 4000 | PS 4500 | PS 5000 | PS 6000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gas volume (m³/min) | 250 | 265 | 275 | 275 | 500 | 525 | 550 | 670 | 710 | 830 | 1,150 | 1,250 | 1,350 | 1,300 | 1,475 | 2,500 | 2,650 | 2,600 | 2,700 | 2,950 | 3,830 |
| Temperature(°C ) | 540 | 580 | 590 | 590 | 540 | 580 | 590 | 540 | 590 | 580 | 600 | 610 | 650 | 620 | 630 | 610 | 650 | 620 | 655 | 630 | 595 |

·Exhaust volume in the case of natural ventilation method (outdoor type specification)

| | PS 200 | PS 250 | PS 250S | PS 300 | PS 375 | PS 500 | PS 500S | PS 625 | PS 750 | PS 1000 | PS 1250 | PS 1500 | PS 1750 | PS 2000 | PS 2500 | PS 3000 | PS 3500 | PS 4000 | PS 4500 | PS 5000 | PS 6000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gas volume (m³/min) | 330 | 355 | 390 | - | 655 | 685 | 760 | 870 | 930 | - | 1,400 | 1,600 | 1,700 | 1,750 | - | 3,260 | 3,450 | 3,300 | 3,600 | - | - |
| Temperature(°C ) | 350 | 355 | 365 | - | 355 | 365 | 375 | 355 | 370 | - | 425 | 420 | 420 | 380 | - | 405 | 435 | 405 | 405 | - | - |

* 1. In the case of the method above, it is easy to install since there is no ventilation duct and fan.
  2. In the case of adopting natural ventilation in models PS300/1000/2500/5000/6000, please contact us.



# Air Supply, Ventilation, Exhaust Duct Size

The sizes of the air supply, ventilation, and exhaust ducts indicated here are for emergency purposes only. If it is for commercial purposes, please consult with us.

## Air supply size

·Natural air supply

| | PS 200 | PS 250 | PS 250S | PS 300 | PS 375 | PS 500 | PS 500S | PS 625 | PS 750 | PS 1000 | PS 1250 | PS 1500 | PS 1750 | PS 2000 | PS 2500 | PS 3000 | PS 3500 | PS 4000 | PS 4500 | PS 5000 | PS 6000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| When louver is installed (m²) | 1.1 | 1.2 | 1.2 | 1.4 | 2.1 | 2.2 | 2.3 | 2.8 | 2.9 | 3.9 | 4.1 | 4.5 | 4.8 | 8.5 | 8.6 | 9.6 | 9.9 | 10 | 10.7 | 15.1 | 15.4 |
| When damper is installed (m²) | 0.6 | 0.6 | 0.7 | 0.8 | 1.2 | 1.2 | 1.2 | 1.5 | 1.6 | 2.1 | 2.3 | 2.5 | 2.6 | 4.7 | 4.8 | 5.2 | 5.5 | 5.6 | 5.9 | 8.3 | 8.5 |

*1. The louver open ratio is set at 50% as a standard, and airflow velocity is limited to 5 m/s.
 2. The damper open ratio is set at 90% as a standard, and airflow velocity is limited to 5 m/s.

·Forced air supply

| | PS 200 | PS 250 | PS 250S | PS 300 | PS 375 | PS 500 | PS 500S | PS 625 | PS 750 | PS 1000 | PS 1250 | PS 1500 | PS 1750 | PS 2000 | PS 2500 | PS 3000 | PS 3500 | PS 4000 | PS 4500 | PS 5000 | PS 6000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Size | 0.8(ID) | 0.8(ID) | 0.9(ID) | 1.0(ID) | 1.1(ID) | 1.1(ID) | 1.1(ID) | 1.1(ID) | 1.1(ID) | 2m² | 2m² | 2m² | 2m² | 3m² | 3m² | 4m² | 4m² | 4m² | 4m² | 5m² | 5m² |

* 1. Louver open ratio is set at 50% as a standard, and airflow velocity is limited to 5 m/s.
  2. Damper open ratio is set at 90% as a standard, and airflow velocity is limited to 5 m/s.

## Ventilation duct size

·Forced ventilation

| | PS 200 | PS 250 | PS 250S | PS 300 | PS 375 | PS 500 | PS 500S | PS 625 | PS 750 | PS 1000 | PS 1250 | PS 1500 | PS 1750 | PS 2000 | PS 2500 | PS 3000 | PS 3500 | PS 4000 | PS 4500 | PS 5000 | PS 6000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Size (W x H : m²) | □0.6 × 0.6 | | | | | | | | | | | | | □1 × 1 | | | □0.85 × 0.85 (x 2) | | | □1 × 1 (x 2) | |

·Natural ventilation: Since this method emits with the exhaust gas, there is no need for a ventilation duct and fan.

## Exhaust Duct Size

·Forced ventilation

| | PS 200 | PS 250 | PS 250S | PS 300 | PS 375 | PS 500 | PS 500S | PS 625 | PS 750 | PS 1000 | PS 1250 | PS 1500 | PS 1750 | PS 2000 | PS 2500 | PS 3000 | PS 3500 | PS 4000 | PS 4500 | PS 5000 | PS 6000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Size (I.D : m) | 0.4 | | | | 0.6 | | | 0.7 | | 0.9 | | | | 1.2 | | 1.3 | | | | 1.5 | |

* 1. The duct size may vary depending on the conditions of the installation location.
  2. Please consult with us in the following cases.
    - If the effective ceiling height is less than 4,500 mm
    - If the duct length is long or there are many bends
    - If the noise level of the exhaust outlet needs to be lowered
    - In the case of natural exhaust method (however, limited to outdoor type).

# Gas Turbine Air Supply, Ventilation, and Exhaust Model

## Air supply, ventilation and exhaust model using forced ventilation method

The ventilation volume is calculated using the following formula.

•In the case of kcal/h

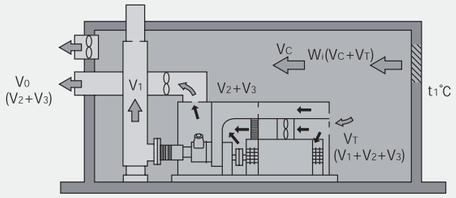
$$Vc = \frac{(\alpha 1 \times QT + \alpha 2 \times QD1 + \alpha 3 \times QD2) \times (273 + t1)}{60 \times \Delta t \times 1.293 \times 273 \times 0.24}$$

•In the case of J/h

$$Vc = \frac{(\alpha 1 \times QT + \alpha 2 \times QD1 + \alpha 3 \times QD2) \times (273 + t1)}{60 \times \Delta t \times 1.293 \times 273 \times 1.005} \times 10^{-3}$$

**However,**
- t1: outdoor temperature (°C )
- Δt: allowable temperature rise (40°C t1- )
- α1: power generator set thermal diffusivity coefficient
- α2: exhaust system thermal diffusivity coefficient (primary system)
- α3: exhaust system thermal diffusivity coefficient (secondary system)
- QT: power generator set heat dissipation rate (kcal/h or J/h)

**However,** QD2: Qd1+Qd2
- Qd1: secondary exhaust silencer surface heat dissipation rate (kcal/h or J/h)
- Qd2: exhaust duct surface heat dissipation rate (kcal/h or J/h)




Direct connection to ventilation duct

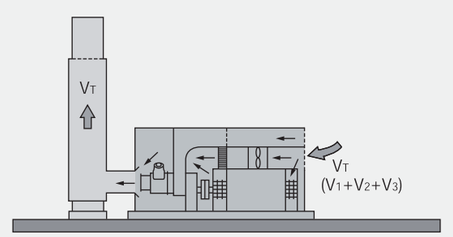
1. Since the thermal diffusivity coefficient and surface heat dissipation rate may vary depending on the installation plan, please consult with us.
2. Since the Vc value may vary depending on the installation plan, please consult with us.

**However,** QT = Q1+Q2+Q3
- Q1: gas turbine heat dissipation rate (kcal/h or J/h)
- Q2: oil cooler heat dissipation rate (kcal/h or J/h)
- Q3: generator loss heat dissipation rate (kcal/h or J/h)
- QD1: primary exhaust silencer surface dissipation rate (kcal/h or
- QD2: J/h) exhaust system heat dissipation rate (kcal/h or J/h)

## Air supply, ventilation and exhaust model using natural ventilation method (outdoor type specification)

This model emits the air for cooling the oil cooler and generator through the exhaust duct using the natural circulation effect driven by the exhaust gas kinetic energy of the gas turbine. It is standard to install this model outdoors.

Because this type has significant exhaust loss, it cannot be applied if the exhaust duct is long or if an exhaust silencer is attached.




Natural exhaust method



# Field Installation Examples

### Ilsan KINTEX Exhibition Hall

GPB15 X 2
(EXHIBITION HALL 1)
GPB30 X 2
(EXHIBITION HALL 2)

### Hanwha Life Insurance

PS4500 X 1

### Government Complex

PS1500 × 2 (Seoul)
PS1250 × 2 (Daegu)
PS1250 × 2 (Gwangju)
PS625 × 2 (Gyeongnam)

### World Cup Stadium

GPB10 × 2 (Suwon)
PS1250 × 2 (Gwangju)
PS1750 × 2 (Incheon)
PS1250 × 1 (Jeonju)

### Naro Space Center

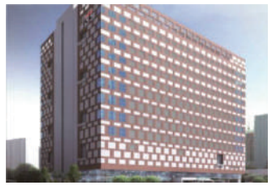
PS2500 X 3
GPB30 X 2

### Korea Hydro & Nuclear Power

TPU4000 × 3
(Sin Kori, Uljin, Yeonggwang)

### KT

PS6000 × 3 (Mok-dong IDC)
PS4000 × 8 (Hyehwa, Guro)
PS4000 × 1 (Busan)
PS2500 × 5
(Beomil, Wonju, Cheonan)



### SK TELECOM

PS4000 × 2
(Seongsu, Incheon)
PS2500 × 2
(Bundang, Dunsan)
PS1750 × 2
(Gangnam, Seongsu)

### LG Uplus

PS4000 × 2 (Anyang)
PS4000 × 3 (Seocho)


### Samsung Medical Center

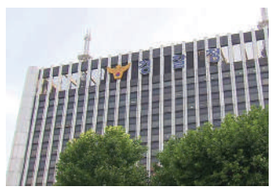
PS1750 X 1
PS3000 X 2

### Seoul St. Mary's Hospital

PS1250 X 1
PS1500 X 1
PS4500 X 1
GPB30, 15 X 1, EACH

### Korean National Police Agency Headquarters

PS1500 X 2

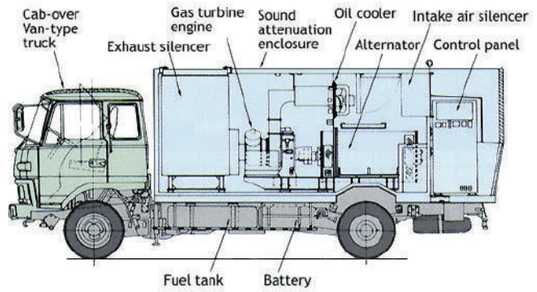


# Portable Emergency Generator (MPU/TPU Series)

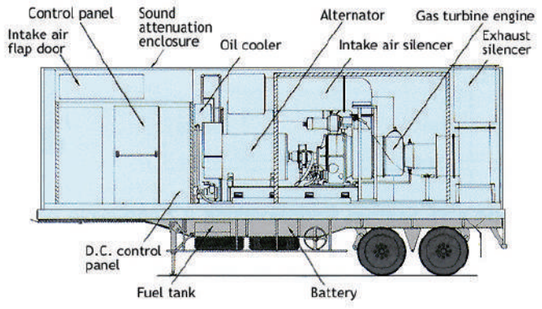
The MPU/TPU Series gas turbine is a truck- or trailer-mounted portable emergency generator.
The MPU/TPU Series power generation package includes all necessary equipment, including those that can be operated automatically without an external power supply. Its advantages include high mobility, strong durability against vibration and shock, and reliable operability.

## Main Components

### Truck-mounted type (MPU Series)




### Trailer-mounted type (TPU Series)




### TPU2000 trailer set

### TPU4500 trailer set

### TPU3000 trailer set

## Equipment Specifications (general)

| Item | Model GPS | | MPU 250 | MPU 500 | MPU 750 | MPU 1000 | MPU 2000 | MPU 2500 | TPU 2500 | TPU 4000 |
|---|---|---|---|---|---|---|---|---|---|---|
| Generator set | Rated output (kW) 40℃ | | 180 | 350 | 600 | 800 | 1,200 | 1,600 | 2,000 | 3,200 |
| | Fuel | | Kerosene, diesel | | | | | | | |
| | Allowable load | | 100% | | | | | | | |
| | Transient speed | | Within ± 4.0% | | Within ± 4.5% | | | | | |
| | Normal speed fluctuation rate | | Within ± 0.6% | | | | | | | |
| | Fuel consumption (L/h) | Kerosene | 130 | 255 | 320 | 490 | 655 | 735 | 1,125 | 1,465 |
| | | Diesel | 125 | 240 | 305 | 465 | 620 | 695 | 1,065 | 1,390 |
| Truck/Trailer | Type | | Truck | | | | | | Trailer | |
| | Standard length including truck | Max. length (m) | 6 | 6.5 | 11 | 11 | | 12 | 9.9 (excluding driver's seat) | |
| | | Max. width (m) | 2 | 2 | 2.5 | 2.5 | | 2.5 | 2.5 | |
| | | Max. height (m) | 2.6 | 2.7 | 3.4 | 3.8 | | 3.8 | 3.6 | |
| | Total weight (ton) | | 8 tons or less | | 20 tons or less | 22 tons or less | | 20 tons or less | 33 tons or less | |
| Generator set noise level (dBA) *at a distance of 1 m | | | 85 | | | | | | | |