

## European Solar and Energy Storage Solutions

# What is the maximum temperature of the generator air outlet



## Overview

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The ambient capability, or ambient clearance of a generator set, is defined as the maximum ambient temperature in which the cooling system can operate effectively without causing the generator set to shutdown due to high engine temperature. Site conditions, including the altitude and relative humidity, will cause the ambient capability to vary.

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The higher the ambient temperature the greater the amount of air flow through the radiator is required. When the ambient temperature rises above that calculated for NTP the maximum power from the engine has to be lowered to avoid over-heating.

Air entering the compressor at point 1 is compressed to some higher pressure. No heat is added; however, compression raises the air temperature so that the air at the discharge of the compressor is at a higher temperature and pressure. Upon leaving the compressor, air enters the combustion system at point 2, where fuel is injected and .

Generator-room temperatures in excess of 104 F typically require de-rating of the generator set and potential upsizing of components to support the design electrical load. The magnitude of de-rating varies with manufacturers, generator set capacity, engine fuel type, and more.

A reasonable approximation is to use the average of T1 and T2e for the compressor, call this T12e, and the average of T3 and T4e for the turbine, call this T34e. The variation of Cp with temperature is given in Table 2.1 as a cubic equation for three fuel-to-air ratios, zero, 0.01 and 0.02 per unit by mass. What is the ambient temperature of a generator set?

So at 18:24, the ambient capability =  $(230 - 198.3) + 82.0 = 113.7^{\circ}\text{F}$ . In this

case, the generator set can continue to operate at full load with an outside air temperature of nearly 114°F. When the ambient temperature is at the maximum 114°F (generator set ambient capability), the air temperature at the radiator core would be 148°F.

What temperature should a generator exhaust be recirculated?

Under fully loaded conditions, the temperature of flue exhaust from generator sets can be in excess of 900 F and the radiator (engine-driven or remote) discharge air temperature can be in excess of 160 F. Any recirculation of these high-temperature airstreams can cause the ventilation air temperature to exceed the ambient temperature.

Why does the ambient capacity of a generator vary?

Site conditions, including the altitude and relative humidity, will cause the ambient capability to vary. When an enclosure is fitted to a generator set with a radiator and pusher/blower fan, it will lower the ambient capability of the generator set.

What should be done if a generator reaches 104 F?

The thermal contamination of ventilation airflow should be eliminated or minimized. Generator-room temperatures in excess of 104 F typically require de-rating of the generator set and potential upsizing of components to support the design electrical load.

Should the ambient capacity of a generator be quoted at full load?

The ambient capability of a generator set should be quoted at full load, which would account for the most arduous running condition since the ambient capability would obviously improve when running at lower loads with less heat being rejected from the engine and alternator.

Where should exhaust air be sourced for a generator?

For generators with remote radiators, it is recommended that the exhaust air should be sourced as high as possible and directly above the generator sets. Significant bypass of ventilation airflow directly into the discharge airflow will lead to reduction in cooling effectiveness and elevated temperatures within the room.

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### Dereating: how Temperature and Elevation Affect ...

Generally, temperature affects generator engines starting at 40°C. Above this ambient temperature: The air is already very hot and its quality is no longer optimal to generate good combustion when mixed with fuel .

### EcoFlow DELTA Pro FAQ: Everything You Need to Know

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### Heat Recovery Steam Generator (HRSG)

The spray attenuation is designed to limit final steam temperature at HP superheater outlet to final design steam temperature. Intermediate Pressure Steam Generator. The IP SG is composed of an economizer (IP ECON), ...

### Understanding Optimal Temperature Ranges for Air ...

The ideal operating temperature of an air

compressor is between 50 and 85°F. Within this temperature range, the mechanical components can operate safely without the risk of freezing or overheating. Most ...



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