

MobilGen™ G70: full power for the rest break

In view of rising average temperatures, demands for the installation of parking coolers in trucks are becoming more and more frequent. Frauscher Motors GmbH has developed a new heat engine called MobilGen™ G70, which supplies the parked truck with electricity quietly and continuously. The innovation provides sufficient energy for the parking air conditioner, the parking heater and to charge the on-board battery. The technical basis is a new type of alphasigma® Stirling engine, which was developed in 180.000 hours.



Especially in the summer, truck driver's cabs can become extremely hot and this often leads to driver fatigue. This is a serious risk to road safety. (Use free of charge, image rights: Erwin Berghammer/Frauscher Thermal Motors)

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St. Marienkirchen bei Schärding. In midsummer, the driver's cab becomes a veritable glowing furnace. If a truck is parked in the blazing sun, the temperature in the cabin can easily reach 50°C after just a few minutes. It is not possible to take a restful break. The heat in the driver's cab poses a serious risk to road safety: According to a study by the German Statutory Accident Insurance (DGUV), at an air temperature of 32°C in the vehicle, the number of accidents increases by 22%. (Source: [DGUV 2019](#))

In Spain and Italy, parking coolers therefore are already mandatory. The Dutch MEP Vera Tax together with trade unions are also working to ensure that all trucks in the EU will be equipped with parking coolers in the future.

There seems to be no alternative to installing parking air conditioners: the capacity of the on-board batteries is not sufficient to continuously supply the air conditioner with electricity. So the

drivers often have to start the diesel engine. On the one hand, this causes a high level of environmental pollution and, on the other hand, enormous noise in the parking lots. Then there are the high fuel costs: According to the Dutch trade union CNV, 20 liters of diesel are consumed if the engine runs all night long. (Source: [DVZ](#))

Complete solution for air condition management in trucks

Frauscher Thermal Motors, located in St. Marienkirchen bei Schärding (Upper Austria), has developed the new heat engine MobilGen™ G70 for the use as a complete solution for air condition management in trucks. The prototype with an expansion volume of 70 ccm achieves a charging current of 40 amperes on a truck battery set with a nominal voltage of 24 volts.

For Ing. Josef Frauscher, Managing Director of Frauscher Thermal Motors, the prototype is a real milestone: “We have been researching and developing Stirling engines for 20 years now. With the development of the MobilGen™ G70 we have achieved a breakthrough. Our new unit was developed for the use as an auxiliary power unit in transit trucks, yachts and large motorhomes and represents a complete solution for the stationary power supply in these vehicles that is unique in the world.”

Heating, cooling and electricity from one unit

In fact, the advantages of the new MobilGen™ G70 are impressive: In summer, it can be used to supply the stationary air conditioner or the electric air conditioning compressor without restrictions. In addition, there is enough energy to operate other consumers such as refrigerators, coffee machines, tail lifts or electrohydraulic drives. In the winter months, the cooling heat from the engine can produce up to four kilowatts to be used for the cabin heating. In addition, the energy can be used to preheat the main engine.

Another key benefit is the protection of the on-board batteries: They are only needed to cover peak loads, e.g. to start the main diesel engine. The batteries are always fully charged, which ensures a long service life.

180.000 hours of development for the new Stirling engine

The technical basis for the unit is a new type of Stirling engine, which is the result of 20 years of research and development work. 180.000 hours went into development. The novelty of the process known as alphagamma® technology has already been confirmed by the German patent office. In addition, the enormous advances in engine technology are recognized in scientific reports by professors from Auckland University of Technology and Reutlingen University.

The innovation uses a new type of differential piston, which lead to a drastic reduction of piston forces. As a result, the frictional forces are minimized in favor of a high efficiency and low engine wear. A detailed description of the process is available here:

<https://www.frauscher-motors.com/stirling-engines/alphagamma-engines/>



With the MobilGen™ G70, Ing. Josef Frauscher set a milestone in engine development. The new engine is planned to be used as an auxiliary power unit in trucks and supply electricity for the parking cooler and other consumers. (Use free of charge, image rights: Erwin Berghammer/Frauscher Thermal Motors)

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Oil-free and as quiet as a refrigerator

Unlike other Auxiliary Power Units which often require an oil change after just 500 hours of operation, the MobilGen™ G70 requires no lubricating oil at all. "We are aiming for a maintenance interval of 5.000 hours - an unequaled value in the field of mobile combustion engines", explains Frauscher. In addition, the unit runs extremely quietly – depending on the installation situation, the noise emissions are hardly higher than those of a refrigerator.

The new configuration has many other advantages: The MobilGen™ G70 has a simple structure, allowing manageable manufacturing costs, a long service life and low-maintenance operation. "Our engine consists of only five moving parts – there are 16 in a comparable Otto engine", says Josef Frauscher. "Almost all parts can be manufactured using cost-effective CNC technology, manual activities are reduced to what is necessary."

Excellent exhaust gas emissions

The MobilGen™ G70 is also fully convincing when it comes to environmental issues. In Stirling engines, the heat is supplied from outside the machine, i.e. under atmospheric conditions. This burner technology generates low exhaust gas emissions - comparable to those of domestic heating systems.

The limit values of the European regulations according to Stage V or those of the US emission standards Tier IV are well undercut and, depending on the operating condition, only reach around 25% of the maximum permissible values when operating with liquid gas. A burner variant with diesel as fuel is under development.

Lightweight power unit fits in a battery case

The prototype of the MobilGen™ G70 weighs only 48 kg. However, Josef Frauscher is sure that the unit can be made significantly lighter: "We have not yet invested in weight optimization, but we know today that we can save another 15 kilograms - without sacrificing performance. The designers are already working on version II of the unit, which, in addition to lightweight construction, also aims for a slimmer design. Then the unit, including the starter batteries, will fit in the truck's existing battery boxes."

Enquiry

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