CREATING
POWER
SOLUTIONS

HATZ



Permanent magnet generators

Hatz Energy Solutions

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The Extremely Compact Way of High-End Power Generation

The vision behind Hatz products has never changed: enable others to be more efficient by fusing professional expertise and the spirit of innovation into reliable, easy-to-use power solutions.
The flywheel-integrated permanent magnet generator (fiPMG) — for use in hybrid systems, as power outage backup or for continuous power supply — proves this once again.

Flexibility and freedom in action
The fiPMG generates electric power when you need it. As an onboard battery charger, for example, this DC generator guarantees that machines always have enough power, wherever they are being used. This ensures that every job can be reliably completed, regardless of the battery's charge status. Thanks to the intelligent CAN connection to machines' battery management systems, the DC generator only charges batteries when machines really need it.

More performance with no compromise
Engines equipped with fiPMG are only slightly larger and heavier than normal engines. Compared to conventional flange-mounted generators, the integrated fiPMG saves on 85 percent of the weight and almost 90 percent of the installation space.
The power take-off shaft, which is still available, makes the machine even more flexible in its design. If the generator is used purely as an engine, a hydraulic pump, for example, can be conventionally flange-mounted using just four screws.

Less fuel consumption, fewer emissions
The fiPMG contributes to emission reduction by allowing for longer machine operation in battery-electric drive mode. Machines can also be operated in emission-free mode where necessary. This reduces the active operation time of the combustion engine and protects the environment. When operated in hybrid mode, machines can save up to 40 percent on fuel, making a significant contribution to curbing emissions.

Ready for the Internet of Things (IoT)
Thanks to integrated Hatz E1 technology, the fiPMG can be integrated into fleet management systems and cloud environments via mobile communications. Operators are able to remotely access the most important operating parameters and monitor the condition of the drive. The fiPMG also allows geofencing and the implementation of future business models such as pay-per-use.

Limitless operation
The 1B30E and 1B50E engines with fiPMG are the only engines on the market today certified as both Stage V and Tier 4 final across their entire speed range. Machine manufacturers benefit from less component variability and are able to develop units that can be operated in both the EU and the US, including California, without any adjustments to the engine.

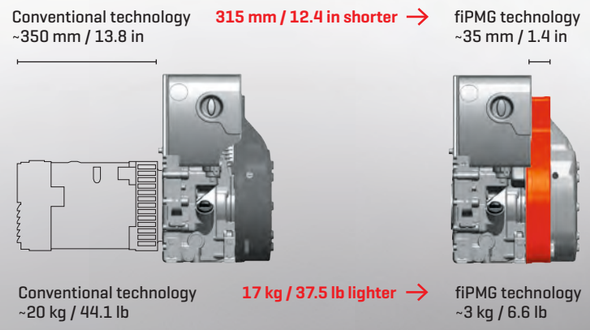
Always ready for use
The fiPMG shows its strengths in applications where maximum reliability is required. Thanks to onboard battery charging, there is no risk of safety-relevant devices failing. This ensures that machines always remain ready for use regardless of their battery's charge status or the availability of an external power supply. This is particularly important for construction infrastructure, like electric road signs and lighting systems, for example.

The Benefits to You

- **Load-dependent speed**
  Quieter operation, fewer emissions, less wear and fewer maintenance costs
- **Double certification: US Tier 4 final & EU Stage V**
  Meeting the world's various emission standards with one product
- **Extremely compact and lightweight design**
  Easy integration, even into existing machine architecture
- **E1 technology**
  Ready for IoT connectivity and fleet management solutions
- **Silent Pack version**
  Ready-made Silent Pack enclosure when noise reduction plays an important role
- **Main power take-off shaft freely available**
  Connection of additional power take-offs possible such as a hydraulic pump
- **Nearly pure sine wave for AC versions**
  High voltage and frequency quality
- **Pre-assembled and pre-tested drive package**
  Less assembly and testing costs for machine manufacturers
- **Battery charger with automatic start/stop function**
  Extremely energy-efficient and self-sufficient operation
- **Efficient and smart control**
  Communication between battery management system and battery charger for the best possible charging cycles and long battery life

fiPMG

Conventional vs. Permanent Magnet
Compared to the conventional design of the engine/generator unit, the flywheel-integrated permanent magnet design is 315 mm / 12.4 in shorter and 17 kg / 37.5 lb lighter. The contactless PMG system has a high degree of efficiency at over 85 percent.




fiPMG with 1B50E engine


fiPMG with 1B30E engine



fiPMG Silent Pack

Always Ready for Use Thanks to the Universal Solution From Hatz

Electric machines driven by batteries or by unreliable grid are always at risk of losing their power before work operations are complete. For such applications, the fiPMG reliably supplies these consumers with direct or alternating current (DC or AC) even under the most adverse circumstances. Whether it's solar powered units operating at night or electric consumers being used on the field without grid: the fiPMG ensures that the necessary energy is always available.

Universal power supply
Unique design, smart features, universally applicable: Hatz offers a power solution, both as AC and DC generators, as an OEM kit for installation in machines or as a finished generator in a Silent Pack enclosure.

Battery charger for large cranes
In order to protect the main engine unit of large cranes and avoid idling operation, Hatz has developed a 28 Volt DC / 100 A battery charger. This ensures that the battery of the additional drive is always charged. The drive supplies the machine's auxiliary consumers when the main engine is stopped.

Battery electric lifting platform
Rented lifting platforms are subject to a wide variety of both indoor and outdoor application scenarios. If lift platforms are used separate from power infrastructure, in agricultural applications such as fruit harvesting for example, batteries with a low charge can cause problems. Using the fiPMG from Hatz as an onboard charger prevents these problems from occurring.

Solar-powered road signs and light towers
Mobile, solar-powered LED road signs indicating dangers further down the road protect lives. Light towers provide the necessary lighting at construction sites. In the event of snowfall or a defect in the solar panels, things can get dangerous. fiPMG-equipped engines can be used as emergency units to bridge gaps in supply, thus increasing safety on the road.

Battery-powered electric agricultural robots
Agricultural field robots remain in near continuous operation while working in the fields, but usually do so without available electricity infrastructure. The fiPMG ensures that operations can be successfully completed in the fields without running out of battery charge. Thanks to its hybrid drive, it also saves up to 40 percent fuel. A fiPMG driven machine is thus the optimal solution for the agricultural business.

Telecommunications masts
Antennas are powered by batteries with a voltage of 56 V DC. For devices located in rural areas, uninterrupted power supply is essential. The fiPMG offers the required reliability for this area of application. For large communications providers, fleet management is also of the utmost importance when it comes to centrally monitoring all connected antennas. The fiPMG completely satisfies both requirements.

Protection against power failures
The fiPMG provides reliable power supply as AC or DC generators in situations where there is an increased likelihood of power failure, such as frequent storms, insufficient sunlight for solar-powered devices or no wind. Even with regionally insulated buildings and appliances being operated away from the power grid, thanks to its fuel consumption of only half a liter per hour, the fiPMG safely bridges longer phases without an external power supply. This can include lighthouses, telecommunications antennas and ecological multi-source power plants.









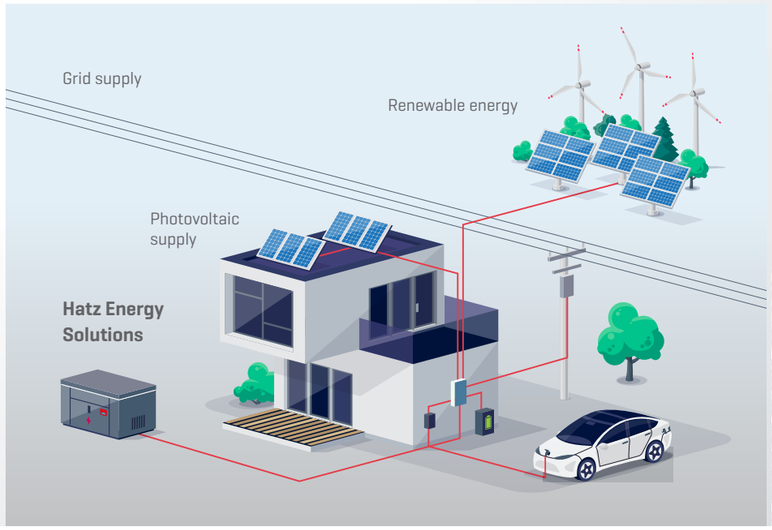






Secure the mission of critical appliances
Numerous applications benefit from the advantages of Hatz fiPMG.
This includes among others:

- mobile lighting towers
- solar and conventional mobile road signal equipment
- mobile communications infrastructure
- electrical lifting equipment
- agricultural field robots
- trade show trailers
- range extender for full battery driven equipment
- auxiliary power units in construction machinery
- ecological power plants





Hatz fiPMG Battery Charger for Diesel Applications

The Hatz fiPMG technology combines integrated logic with electronically controlled injection, enabling load-dependent speed regulation.



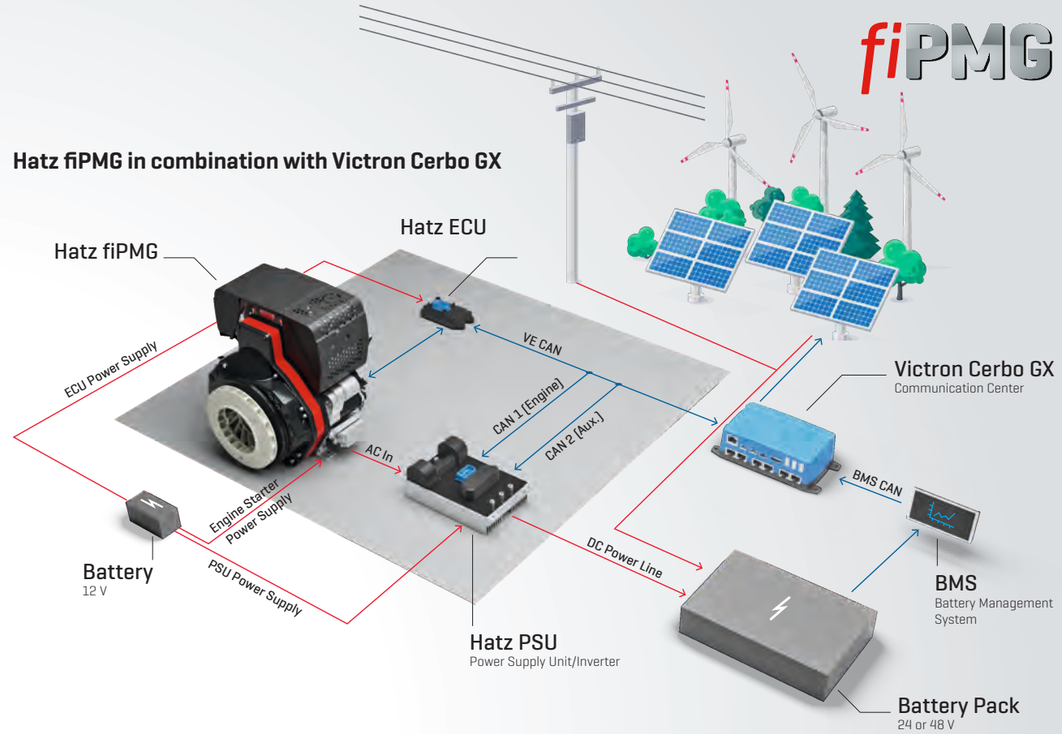
fiPMG with horizontal shaft engine

This innovative solution ensures that the performance of the battery charger is automatically adapted to varying conditions such as operating altitude and ambient temperature. This ensures a continuous charging process for the battery under different operating conditions.

The battery charger is flexibly controlled via CAN bus or a digital input. The new double CAN bus inverter enables bi-directional communication with a higher-level control unit or a battery management system (BMS) to be easily realized.
This highly developed interface technology ensures efficient and reliable integration into complex system environments.



fiPMG with vertical shaft engine



Battery charger Diesel OEM kit

Type	PMDC-28-100	PMDC-28-200	PMDC-56-55	PMDC-56-100
Max. Power @ cos(ϕ) 1.0 [kW]	2.8	5.6	3.0	5.6
Max. current [A]	100	200	55	100
Voltage [V]	28	28	56	56
Type of voltage	Direct current (DC)			
Generator	flywheel-integrated Permanent Magnet Generator (fiPMG)			
Inverter output accuracy acc. ISO 8528-5	class G4			
Total electrical efficiency [%]	85.5			
Engine	1B30E	1B50E	1B30E	1B50E
Speed range [rpm]	1800 – 3100	3000	1800 – 3100	1800 – 3000
Start system	electric, 12 V			
Emission certificate	dual type plate: EU Stage V + US EPA/CARB Tier 4 final			
Noise level @ 7 meters [dB(A)]	72 @ 2300 rpm	76 @ 2300 rpm	72 @ 2300 rpm	76 @ 2300 rpm
Fuel consumption @ ¾ load [l/h]	0.7 @ 2300 rpm	1.2 @ 2300 rpm	0.7 @ 2300 rpm	1.2 @ 2300 rpm
Dimensions L x W x H [mm]	331 x 410 x 430	357 x 440 x 480	331 x 410 x 430	357 x 440 x 480
Weight [kg]	59	75	59	71

Battery charger Diesel Silent Pack

Type	BD 3000 Silent Pack	
Max. Power @ cos(ϕ) 1.0 [kW]	2.8	3.0
Max. current [A]	100	55
Voltage [V]	28	56
Type of voltage	Direct current (DC)	
Generator	flywheel-integrated Permanent Magnet Generator (fiPMG)	
Inverter output accuracy acc. ISO 8528-5	class G4	
Total electrical efficiency [%]	85.5	
Engine	1B30VE	
Speed range variable [rpm]	1800 – 3100	
Start system	electric, 12 V	
Emission certificate	dual type plate: EU Stage V + US EPA/CARB Tier 4 final	
Noise level @ 7 meters [dB(A)]	64.6 @ ½ load	
Fuel consumption @ ¾ load [l/h]	0.7 @ 2300 rpm	
Dimensions L x W x H [mm]	776 x 449 x 466	
Weight [kg]	102	



fiPMG Silent Pack with noise insulation

Hatz fiPMG AC Generators OEM Kit

The Hatz fiPMG technology can be seamlessly combined with the robust and reliable single cylinder engine of the 1B series. The engine generator unit is available in both horizontal and vertical versions, ensuring a high degree of flexibility in the application.

Compact design:
By integrating the generator into the engine flywheel, the fiPMG offers the most compact and lightest solution in its class, making it the ideal choice for applications with limited installation space.

Industrial quality:
Hatz technology follows a clear philosophy: maximum efficiency is combined with outstanding quality and attractive design. These values guarantee our customers long-term, reliable performance.

Variable speed operation:
Thanks to the innovative E1 technology, the fiPMG is operated at variable speeds depending on the load. This technology optimizes efficiency and helps to reduce emissions, noise, wear and maintenance costs. It enables particularly efficient operation, even with changing or low loads.

Generators Diesel OEM Kit

Type	PMAC-230/5-3.0	PMAC-120/6-3.0
Max. Power @ cos(ϕ) 1.0 [kW]	3.0	3.0
Max. current [A]	13	25
Voltage [V]	230	120
Frequency [Hz]	50	60
Type of voltage	Alternating current (AC)	
Generator	flywheel-integrated Permanent Magnet Generator (fiPMG)	
Inverter output accuracy acc. ISO 8528-5	class G2	
Total electrical efficiency [%]	85	
Engine	1B30E	
Speed range variable [rpm]	1800 – 3100	
Start system	electric, 12 V	
Emission certificate	dual type plate: EU Stage V + US EPA/CARB Tier 4 final	
Noise level @ 7 meters [dB(A)]	70 @ 2000 rpm	
Fuel consumption @ ¾ load [l/h]	0,7 @ 2000 rpm	
Dimensions L x W x H [mm]	331 x 410 x 430	
Weight [kg]	59	



fiPMG with vertical shaft engine



fiPMG with horizontal shaft engine



fiPMG with engine, deep oil pan and inverter

Hatz AC Generators Silent Pack

The AC generators in the Silent Pack series are by their sound-insulated design, which, combined with an extremely compact and lightweight construction, offers high efficiency with minimal noise levels.

Flexibility in the type of drive:
Diesel or petrol drive
Depending on the specific requirements of the application, the Silent Pack AC generators are with either diesel or petrol drive. This selection makes it possible to choose the optimum operating variant for different operating conditions and performance requirements.

Special RV version for mobile use
The RV version, specially developed for installation in mobile homes, for example, offers outstanding functions. Particularly noteworthy is the additional diesel tank, which is equipped with sensors and is filled automatically thanks to embedded logic in the E1 control unit. This intelligent solution simplifies operation and increases operational safety.

Outstanding load connection properties:
The Silent Pack generators offer excellent load switching characteristics that far exceed the rated power. This is particularly advantageous when demanding loads with high starting currents need to be operated reliably.



fiPMG Silent Pack


GP 2600 Silent Pack


GP 6200 Silent Pack

Generators Diesel Silent Pack

Type	GD 3000 Silent Pack		GD 3200 Silent Pack RV
Max. Power @ cos(ϕ) 1.0 [kW]	3.0		3.2
Max. current [A]	13	25	26
Voltage [V]	230	120	120
Frequency [Hz]	50	60	60
Type of voltage	Alternating current (AC)		
Generator	Generator Flywheel-integrated permanent magnet generator (fiPMG)		
Speed range [rpm]	1800 - 3100 (variable) / 3100 (constant)		
Inverter output accuracy acc. ISO 8528-5	class G2		
Total electrical efficiency [%]	83		
Engine	1B30VE		
Start system	electric, 12 V		
Emission certificate	dual type plate: EU Stage V + US Tier 4 Carb		
Noise level @ 7 meters [dB(A)]	64.6 @ 3100 rpm @ ½ load		
Fuel consumption @ ¾ load [l/h]	0.6 @ 3100 rpm		
Dimensions L x W x H [mm]	776 x 449 x 466		
Weight [kg]	102		

Generators Petrol Silent Pack

Type	GP 2600 Silent Pack	GP 6200 Silent Pack
Max. Power @ cos(ϕ) 1.0 [kW]	2.6	6.2
Max. current [A]	11.3	26.9
Voltage [V]	230	230
Frequency [Hz]	50	50
Type of voltage	Alternating current (AC)	
Generator	Permanent Magnet Generator	
Speed range variable [rpm]	2500 - 3600	2600 - 3600
Inverter output accuracy acc. ISO 8528-5	class G1	
Engine	Honda GX160	Honda GX390
Start system	electric, 12 V	
Emission certificate	EU Stage V	
Noise level @ 7 meters [dB(A)]	59	66
Fuel consumption @ ¾ load [l/h]	1.2	3.7
Dimensions L x W x H [mm]	493 x 387 x 291	633 x 552 x 440
Weight [kg]	44	112

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