Starter Motors and Generators

Bosch generators – a reliable energy supply of high efficiency

BOSCH
Invented for life

Leaders **in power-output and efficiency**

Bosch has almost 100 years of experience in the development and manufacture of generators. Knowledge that pays dividends – not only for motorists but also for vehicle manufacturers. The latest examples of our competence and innovative ability are the New Baseline and Efficiency Line Generators for cars. With this range of generators Bosch covers a wide range of applications.

Efficiency for a variety of power-output requirements

Whether for small cars with low electrical energy requirements or for mid class or upper class vehicles with a wide range of safety and comfort functions – Bosch offers the right generator: precisely matched to the power-output requirements of the electrical system of the specific vehicle concerned. We thus guarantee a reliable supply of energy to all electrical consumer units, at the same time providing a high degree of efficiency and economy.

Fields of application for the New Baseline and Efficiency Line Generators

Powerful in every situation

Quite apart from their type and size, all Bosch generators feature excellent power output even at low engine speeds (1,800 rpm). A further advantage is that the performance of the generator does not fall off noticeably even at high temperatures.

Together achieving better technical layout

In order to ensure the best possible application to the vehicle model concerned, we cooperate closely with the car manufacturers. We thus offer our customers the opportunity of determining the most efficient combination of generator and battery at an early stage of development via computer simulation.

Advantages of Bosch generators:

- **Reduced fuel consumption**
- **Fewer emissions**
- **High reliability**
- **High quality**
- **Global platforms**

Bosch generators: efficient links between the drivetrain and the vehicle's electrical system

A firm basis – **robust designed, compact, particularly economical**

For automobiles with lower electrical energy requirements, Bosch has developed the New Baseline Generators. These robust designed generators of compact construction are manufactured within our framework of international production cooperation (“local for local”) and are particularly used in cost-favorable small cars. The functional capabilities and the performance of the New Baseline Generators (NBL) has been specially matched to the requirements of this vehicle segment.

New Baseline Generator

The most economical solution for the lower power-output range

With three sizes, the New Baseline Generators cover the performance range between 1.0 and 1.8 kW. A speed of 6,000 rpm provides a rated current of 70 to 125 Ampere. The generators thus supply enough energy for the reliable, efficient supply of small cars with low-volume engines and vehicle electrical systems supplying only a few electrical consumer units.

New Baseline Generators from Bosch guarantee mobility all over the world

Ideal for tight spaces

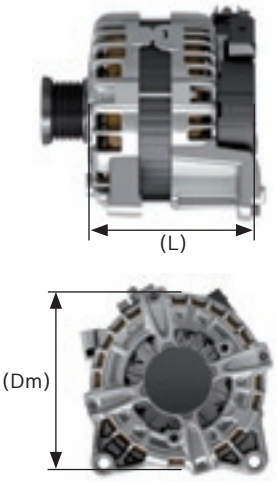
With their particularly short design of between 117.5 and 120.5 mm, they are also suitable for mounting where space in the engine compartment is tight.

On-the-spot manufacture and application

The New Baseline Generators are manufactured in our production facilities in Brazil, China, South Africa and India. In the future production in Europe will follow as well. Application is also carried out locally in the countries concerned.

In this way we reduce time and expensive efforts, simplify direct cooperation with customers and permit the adaptation of global platforms to the different regional requirements.

	New Baseline	
Technical data of 14 Volt version	**from**	**to**
Rated current at 1,800 rpm (A)	37	65
Rated current at 6,000 rpm (A)	70	125
Efficiency, VDA (%)	54	66
Magnetic noise (dB) up to 3,500 rpm	74	74
Aerodynamic noise (dB) at 10,000 rpm	94	94
Length (L) without belt pulley (mm)	117.5	120.5
Diameter (Dm) without bolts (mm)	125	140
Weight without belt pulley (kg)	4.3	5.5
Inertia (kg/cm^2, without belt pulley)	16.5	25



Efficiency that pays dividends – **reduced fuel consumption, less CO_2 output**

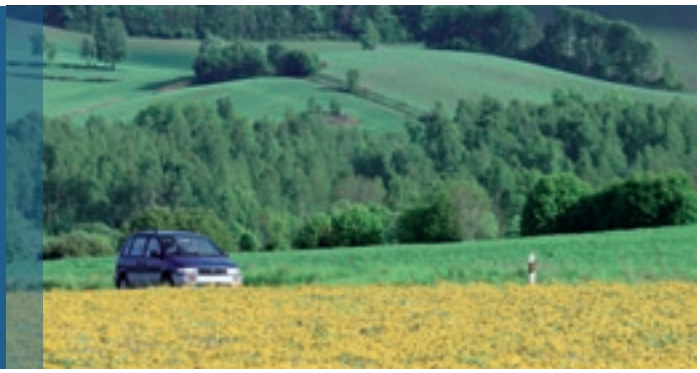
Stricter legislation on clean air together with unstable fuel prices tending upward are increasing the demand for clean, economical automobiles. So the development of our Efficiency Line Generators (EL) concentrated not only on high performance but above all on increased efficiency. The result: a new, extremely efficient generation of generators with a particularly high degree of efficiency permitting reductions in fuel consumption as well as CO_2 output of up to 2% – good for motorists, good for the environment and an important sales argument for vehicle manufacturers.

Efficiency Line Generator from Bosch: efficient, environmentally friendly, economical

Increased efficiency, reduced fuel consumption

The greater the efficiency, the more effective the generator and the less fuel required for generating electrical energy. Thanks to their further improved electrical layout, the new generation of generators achieves an very high degree of efficiency which can – if an optional High Efficiency Diode (HED) from Bosch is used – amount to as much as 77% (according to VDA). The HED increases not only the efficiency but also the performance of the generator.

A high degree of efficiency pays dividends. For motorists and for the environment



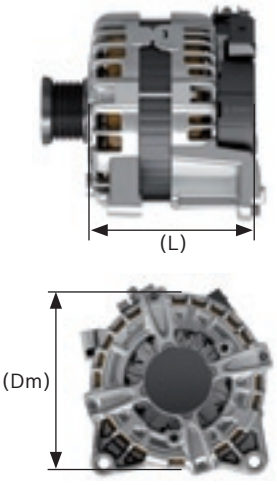
The economical, clean solution for all performance ranges

By comparison with their predecessors, the performance of these generators has been further increased, especially at low engine speeds. Our EL series is available in three sizes. These cover a performance range from 130 to 210 Ampere (at 6,000 rpm). EL generators are thus suitable for reliably supplying the widest possible range of vehicle electrical systems with energy.

Greater comfort and additional freedom for application engineering

EL generators are quiet in operation and can be supplied with multifunction regulators (MFR) or regulators with a communication interface such as LIN, for instance. Yet another convincing feature is their light, compact design and their heat resistance to temperatures of up to 125 °C. Different mounting situations within the engine compartment are thus no problem.

	Efficiency Line	
Technical data of 14 Volt version	**from**	**to**
Rated current at 1,800 rpm (A)	70	115
Rated current at 6,000 rpm (A)	130	210
Efficiency, VDA (%)	70	77
Magnetic noise (dB) up to 3,500 rpm	72	72
Aerodynamic noise (dB) at 10,000 rpm	92	94
Length (L) without belt pulley (mm)	120.5	135
Diameter (Dm) without bolts (mm)	140	148
Weight without belt pulley (kg)	5.6	7.0
Inertia (kg/cm^2, without belt pulley)	25	38



A wide range of regulator functions – **for maximum generator performance**

The generators are equipped with innovative VR voltage regulators available worldwide and manufactured to a uniform production concept. With their axial, radial or tangential plug connections they can be adapted to an extremely wide range of vehicle models. These voltage regulators afford that the generator functions reliably and that data is continuously exchanged between the existing control units.

Developed for smooth communication

Bosch voltage regulators can be combined with a variety of interfaces. Thus the LIN (Local Interconnected Network) communication interface creates the precondition for data exchange with an intelligent generator control system. Via the recuperation of braking energy, this permits additional reductions in fuel consumption and CO_2 output of up to 2%.

VR voltage regulator: available worldwide, it affords reliable communication and safe generator operation

A stable vehicle electrical system is the basis for safe, comfortable driving. Bosch voltage regulators make an important contribution to this

Drivetrain functions of the voltage regulator:

- Load-response function for start and driving (influencing control behavior under certain operating conditions)
- Input to drivetrain ECU of generator-state variables
- Generator regulation in line with set-point values (torque management)

Functions of the voltage regulator in the vehicle electrical system:

- Voltage regulation
- Display of generator loading
- Fault diagnosis

Further advantages:

- Stable voltage supply
- Low standby current
- High temperature resistance
- Integrated EMC and ESD protection
- Communication with other control units via analog or bus interface
- Link between drivetrain and vehicle electrical system
- Improved vehicle layout
- Improved engine idling

	Connection/Communication		Possible functions			
Type of regulator	**Connection**	**Interface**	**Standard communication**	**Comfort**	**Recuperation***	**Torque management***
VR1-MFR	2-Pin	analog (L, DFM)	X	–	–	–
VR1-PWM	2-Pin	analog (PWM, DFM)	X	X	X	–
VR1-LIN	1-Pin	digital (LIN)	X	X	X	X

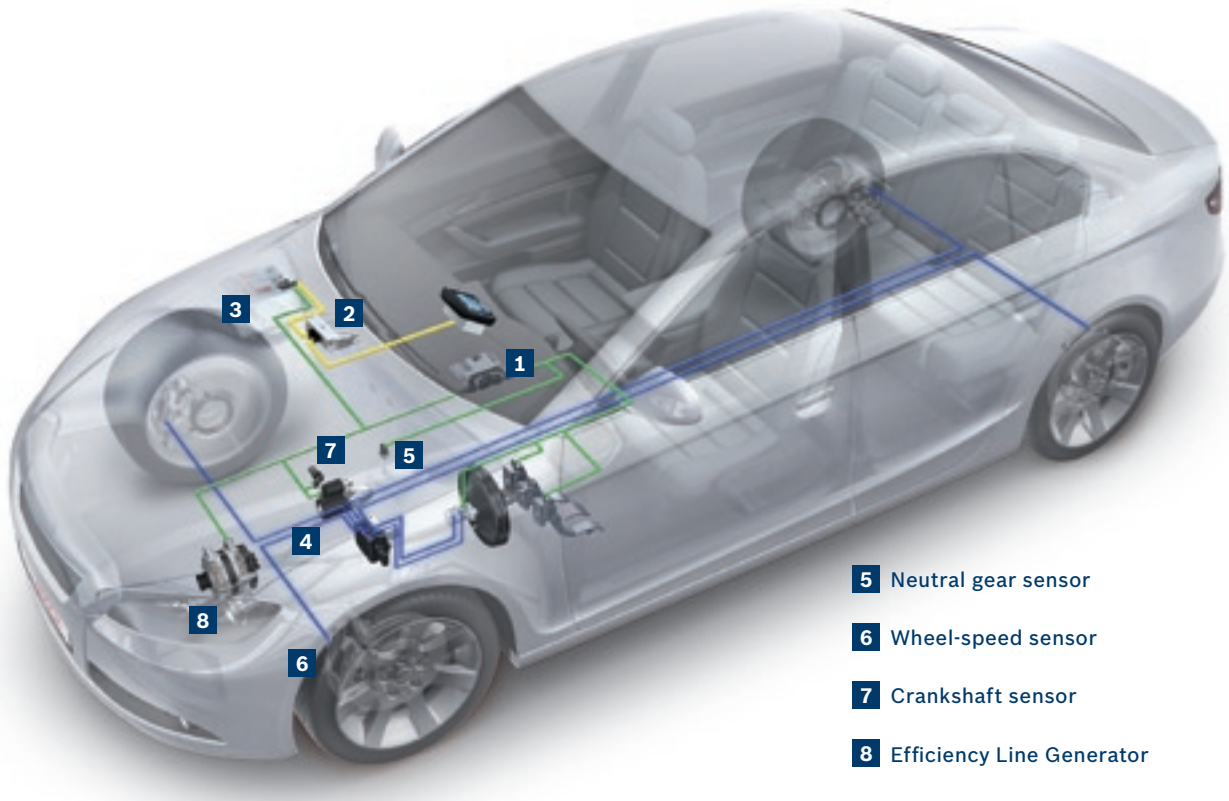
VR voltage regulators from Bosch fulfill a wide range of customer requirements and support a large number of different functions

(*Optional preparation of the generator for the realization of functions by the customer)

DFM: Dynamo Field Monitor
EMC: Electro-magnetic compatibility
ESD: Electro-static discharge
L: Lamp
LIN: Local Interconnected Network
MFR: Multi-function regulator
PWM: Pulse-width modulation

Economical and clean in urban traffic – **particularly efficient for “Stop-and-Go”**

The special performance features of our EL generators are particularly noticeable in urban traffic. For even at low engine speeds and right after the vehicle first starts up, the new generation of generators produces more electrical energy to supply the electrical system. So EL generators are the perfect solution for use in vehicles with Start/Stop Systems – and they also increase the availability of the start/stop function as such.



1 Engine control unit with start/stop software option

2 DC/DC converter 12V

3 Battery sensor

4 Start/Stop Starter Motor

5 Neutral gear sensor

6 Wheel-speed sensor

7 Crankshaft sensor

8 Efficiency Line Generator

Start/stop technology from Bosch. Save every time you stop

Economical solution for better air

In the measuring cycle ECE15, the urban section of the New European Driving Cycle (NEDC), the generator cuts down fuel consumption and thus also CO_2 output by around half a percentage point. Here the NEDC defines a load on the vehicle's electrical system of 350 Watt. Under actual driving conditions, where the power requirements of the electrical consumer units varies from 800 to 1,250 Watt, savings can be quadrupled to as much as 2%.

Powerful right from the start – just what Start/Stop needs

Our Start/Stop System only switches the engine off if the charge in the vehicle's battery will permit a reliable restart. During such stops the electrical system is of course supplied exclusively by the battery. EL generators are extremely powerful especially at low engine speeds and are thus in a position to recharge the vehicle's battery quickly.

So even shortly after each restart, sufficient electrical energy is available to cope with the next stop.

The combination of EL generator and Start/Stop System from Bosch makes it possible to reduce both fuel consumption and CO_2 output in urban traffic by up to 10%.

Strong combination for clean, economical driving: Start/Stop Starter Motor and Efficiency Line Generator from Bosch

The best solution – for customers and the environment

Bosch engineers are continuously working on innovative system solutions. The success of these developments speaks for itself: for decades Bosch has been one of the world's leading companies in the field of patented inventions.

Starter motors

Our extensive range comprises innovative, sturdy starter motors for all passenger cars with gasoline and diesel engines. In addition to high starting reliability, Bosch starter motors, with their compact, light construction, allow simple application for vehicle manufacturers. As well as conventional starter motors, we offer a broad range of tried-and-proven Start/Stop Starter Motors for economical and comfortable start/stop solutions in vehicles.

Generators

Bosch offers a broad range of compact, quiet-running generators for a wide variety of requirements and all types of passenger car. They feature high performance and efficiency. Our generators thus allow a reliable supply of energy to every vehicle electrical system and contribute towards an appreciable reduction in fuel consumption and CO_2 output.

Solutions for commercial vehicles

Our product range for commercial vehicles comprises sturdy, powerful starter motors and efficient generators. High quality products with a service life of some 800,000 km, suitable for demanding applications and the toughest working conditions in on- and off-highway operation.

Robert Bosch GmbH
Starter Motors and Generators

Postfach 30 02 40
70442 Stuttgart
Germany

www.bosch.de/k

Printed in Germany
292000P086-C/CCB2-200908-En