

Technical Information

Electronics – Actuators



*Ideas today for
the cars of tomorrow*

Actuators from Hella

Increasing demands for more operating comfort, a higher degree of safety and reduction of fuel consumption and more stringent environmental vehicle requirements at the same time lead to the development of ever more intelligent and thus more complex systems. These include air conditioning systems, braking and locking systems as well as engine management. Reliable actuators such as pumps and electromotive actuators are required to carry out these functions.

Hella has been developing and producing actuators for more than 40 years. The demands made on actuators have increased significantly during this period. The functionalities are becoming more complex, reliability is increasing and functional ability must be guaranteed over an ever longer service life. In addition, the systems are consistently becoming easier to diagnose.

At Hella, these demands are being met by a modular system which makes the supply of easily produced and favourably priced solutions possible. Based on the modular system, customers can be supplied with individual tailor-made solutions in next to no development time.

The actuators developed by Hella are high performance components adapted to one particular installation location. Electromechanical and electronic components are integrated in the intelligent actuators. These mechatronic solutions meet the requirements of both present and future vehicle electric system structures.

Hella has been able to build up competence in this area over many years, enabling them to supply actuators with appropriate technologies and approaches at solutions that work reliably even under the most unfavourable of environmental conditions. The demands of future applications can also be met thanks to continual product innovations.

Hella already has development and production locations for actuators available worldwide and is continuing to expand its international competence, mainly in the NAFTA and Asian regions.



Product portfolio EE-8 actuators

Actuators for locking systems

Typical areas of application for such actuators are the locking /unlocking and remote control of fuel filler lids, trunk lids, bonnets, storage compartments and various special applications. Hella has a wide range of customer-specific and system-specific electromotive actuators available, the main features of which are their compact design, simple mounting and good cost-effectiveness.

Based on modular systems, Hella develops and produces a comprehensive range of electromotive actuators for car body applications which are tailor-made for customer-specific system requirements. These modular systems are suitable for the functional requirements of

- actuating power and speed requirements
- automatic resetting of springs or electromotive resetting
- attachment – if necessary in a noise-decoupled design
- mechanical connection between actuator and locking system
- electrical connection – standardised or customer-specific if necessary –

for various applications in both dry and humid environments.

Since 1996, Hella has been producing such actuators on fully automatic production facilities in quantities of currently more than 9 million units a year on 3 continents.



Actuators for locking systems

Vacuum pumps for brake boosters

Vehicle brake boosters usually work with a vacuum generated by the engine. Under certain operating conditions the unthrottled operation of modern engines can sometimes lead to a loss of vacuum in the intake tract. This means, that sufficient brake boost support cannot be guaranteed.

To use conventional and well-proven brake boosters work in modern engines despite this, a vacuum supply is required which is independent of the engine. Taking technical and economical aspects into consideration, an electromotive driven auxiliary pump is the best solution here.

Hella has developed such a pump, which can be operated as required by means of an electronic control, as an add-on version. It is maintenance-free, low-noise and works independently of the engine. Its need-oriented activation makes a considerable contribution to fuel saving efforts in comparison to permanently driven pumps.

The electronic controls have been designed in a way that does particular justice to different requirements with regard to individual customer-specific control algorithms. This means that the pump system is also easy to install in vehicles as a retrofit device.

The add-on version vacuum pump has been being mass produced since September 1999.



Vacuum pump (demonstration sample)

Actuators for air conditioning systems

Innovative vehicle air conditioning systems provide customers with a high degree of comfort in terms of temperature distribution, air circulation etc. in a wide range of environmental conditions. This comfort is based on a wide range of different individual functions within the air conditioning system that all require application-specific actuators.

Hella develops and produces such actuators for air conditioning systems following the modular principle, in particular in order to meet customer-specific requirements on the European market. Within the modular system, the actuators are classified according to their function:

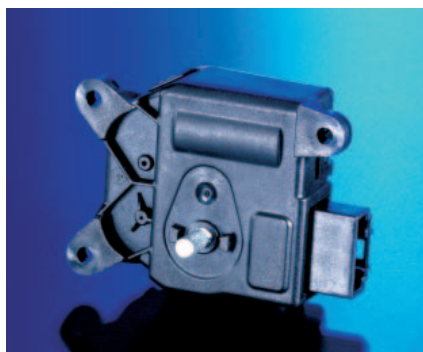
- ON/OFF actuators
- Multi-position actuators with electric switch-off
- Infinitely adjustable actuators with position feedback
- Infinitely adjustable actuators with self-regulation

Hella is currently working on the development of a new generation of actuators specially adapted to the customer-specific and system-specific requirements of the NAFTA market.

In addition, Hella is increasingly making a name for itself with system suppliers as a competent partner in matters of further development of air conditioning systems. Thus, for example, an actuator with small dimensions which is suitable for use in air conditioning systems with pulse-count technology has recently been developed.

Hella actuators stand for high economy, quality and reliability. This is guaranteed both by the use of individual parts that have proved themselves in mass production and assemblies as well as by means of the continual improvement process.

Not least the fact that Hella has been mass producing actuators for air conditioning systems for the past 20 years underlines this claim even more emphatically.



Basic unit of a modular system



Pulse-count actuator

Washer pumps

Hella develops and manufactures pumps for windscreen and headlamp cleaning systems with different power requirements.

Windscreen washer pumps are required for cleaning the windscreen or the rear window if necessary. These functions can either be covered by single outlet pumps or a dual outlet pump. When a dual outlet pump is used, the windscreen and rear window are both supplied by only one pump which achieves this due to a reversible direction of rotation. The dual outlet pump has an integrated return valve which prevents the long tube leading to the rear window emptying once the pump has been switched off.

Headlamp cleaning system pumps require more power in order to clean the headlamps using the jet-blast principle. A snap-on coupling is used to adapt the tube system. This enables the simple, quick and safe adaptation of the tube system.

Washer pumps have been being produced in large quantities since the beginning of the 1960s. Alongside the pumps, components such as tube systems and nozzles for a wide range of applications are included in the scope of supply, making solutions with optimally matched components possible.



Washer pumps

Engine compartment regulators

Increased demands on consumption and emission are placing ever greater demands on vehicle regulation and control systems. One of the effects of this is that the pneumatic control systems used today are being replaced more and more often by electromotive systems.

Based on the experience gained from a multitude of actuator generations, Hella has developed actuators that can be used for almost all applications, e. g. turbocharger control, intake air throttling in the engine compartment and multipath intake manifold.

These components have already qualified themselves for use at ambient temperatures of up to 125°C and vibrations up to 30 g and enable actuating times of approx. 200 ms for 90° angle or rotation. Contactless sensors are preferred for position feedback.

Position recognition and electrical connection are integrated in the cover, so that simply exchanging the cover, for example, makes it possible to change the device from a two-position regulator to one with infinite regulation of the actuating position without extensive modification being necessary. The modular system also makes it possible to integrate other component-specific electronics.

The outstanding features of the actuators' technical design are the hybrid-based electronics and the high temperature-resistant interconnection technology used for engine compartment applications. The engine management interface can be realised using PWM or CAN.

Hella has been mass producing these actuators since mid 1999.



Engine compartment actuator with regulating electronics

Hella KG Hueck & Co.
Rixbecker Straße 75
59552 Lippstadt/Germany
Tel.: +49 (0) 29 41/38-0
Fax: +49 (0) 29 41/38-71 33
Internet: www.hella.com

For technical enquiries:
PLE-8 Actuators
Tel.: +49 (0) 29 41/38-29 37
Fax: +49 (0) 29 41/38-83 57



*Ideas today for
the cars of tomorrow*