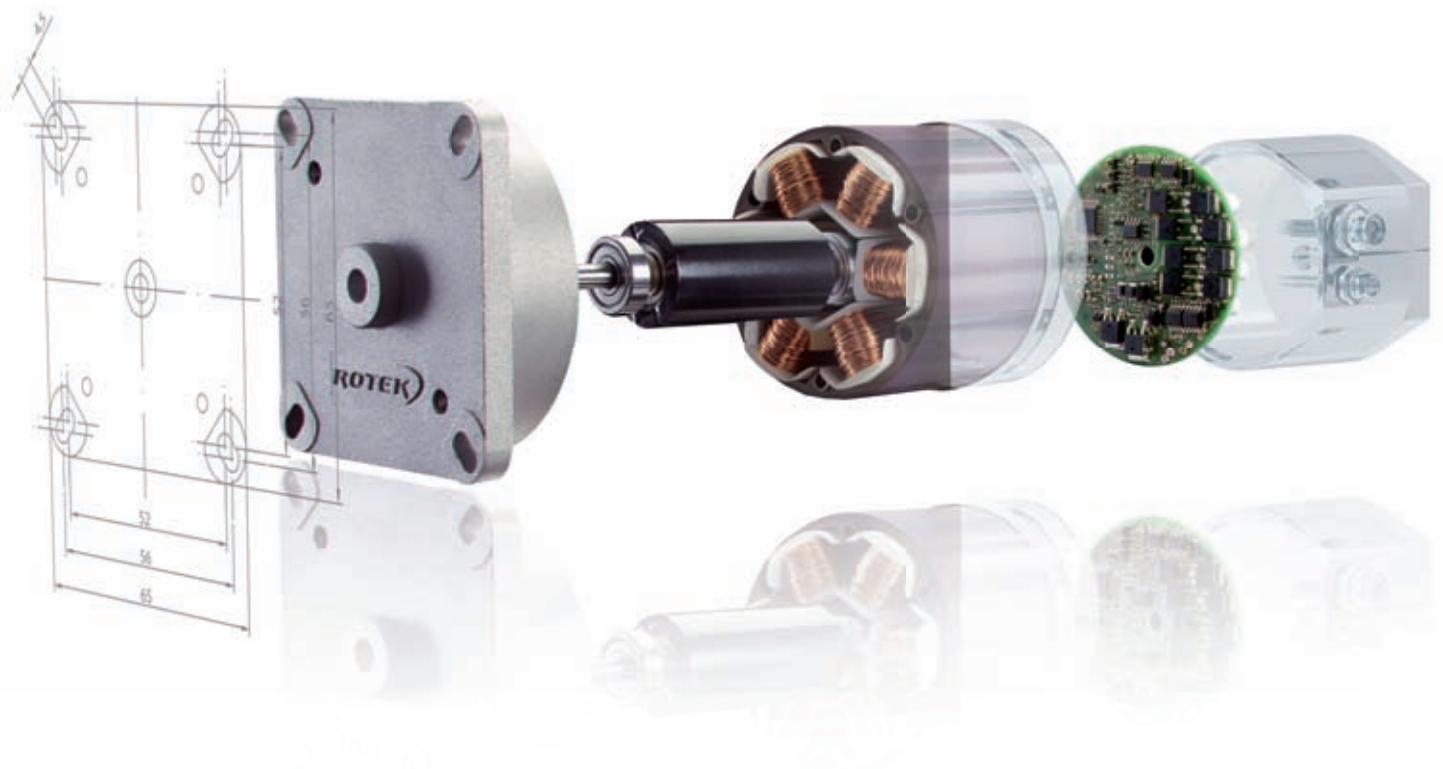


# konstruktions praxis

2014  
12

ALLES, WAS DER KONSTRUKTEUR BRAUCHT



## DRIVE TECHNOLOGY

The advantages of integrating the electronics directly into the drive

## DRIVE, CONTROL, MOVE

Linear technology, efficient motors, bearing and gear

SPECIAL

# Integrated electronics increase flexibility

A new, brushless DC motor integrates the control electronics directly in the drive. This massively increases flexibility.



The Raven is considered to be one of the most intelligent animals - For RoteK, it therefore represents the intelligence of the new Romotion motors with integrated electronics



**TITLE**

The drives are initially offered in connection with planetary gears.

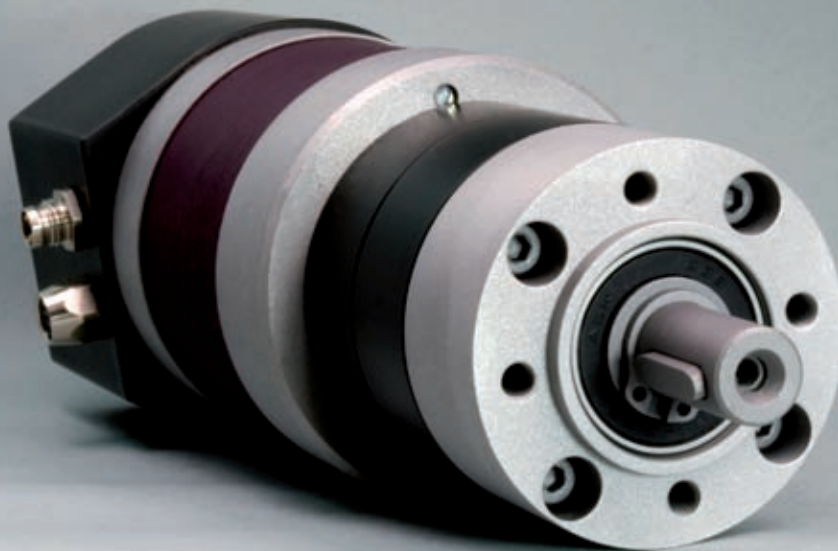


PHOTO: ROTEK

**R**otek introduced a new series of motors some time ago. To this day, the Rosync motors are characterised by their superior efficiency. They achieve efficiencies of up to 75% or 90% as capacitor and three-phase motors. Thus, the motors are world leaders on the market in the performance class up to 100 W. At the same time, they are particularly compact - this allows for installation even in confined spaces. In conjunction with the flexible modular system, Rotek provides individual solutions even in small batch sizes. The motor manufacturer from Bremerhaven is now advancing into new markets. Based on the technology developed for the Rosync, the company introduced the Romotion integrated EC drive at SPS/IPC/Drives 2014. The heart is a three-phase brushless DC motor. The low-voltage range electronics are integrated directly in the drive as a standard feature. As an option, the controls can be externally located, especially if there is a need to cover increased temperature ranges.

### Control via bus connection

The intelligent electronics provide opportunities that go far beyond simply controlling the motor windings. Control signals can be provided to the drive either via analogue interfaces or an integrated bus. Modbus is the default, and it is also used for parameterisation. In addition, optional solutions for CAN and Profibus are also possible.

In the basic version presented here, commutation occurs without sensors; there is no need to install additional sensors for rotor position detection. This allows the controls to be installed in a cost-efficient and space-saving way. The principle is simple: The electronics' speed controller receives its nominal value as a DC voltage signal between 0V and 10V. The DC voltage is converted into a digital signal, i.e., into a number, by the electronics. The electronics receives the speed actual value via the frequency of the motor's EMF. The power for controlling the motor coils is calculated from this comparison. The speed is set to the desired nominal value using the regulator and maintained largely independently of the required torque.

### Analogue and digital inputs

There are digital inputs as well as analogue inputs for the nominal speed value. For example, for the release and the desired motor rotation direction. At the same time, error and brake chopper inputs are integrated. In addition, three unassigned digital inputs/outputs are available for application-specific use, e.g., for optional rotor position detection (hall sensors, photoelectric sensors or angle sensors) or even for end position detection in the equipment engineering. The serial interface, a single-wire bus which relies on the Modbus protocol, is particularly important. This serial inter-



### COMMENT

The number of small electric motors is virtually skyrocketing. At the same time, the demands on small motors are also increasing. Where they can be controlled intelligently using electronics, they can be made even smaller. This saves materials and costs.

Ute Drescher  
ute.drescher@vogel.de



**Klaus Treusch, Managing Director of Rotek GmbH, Bremerhaven, Germany**

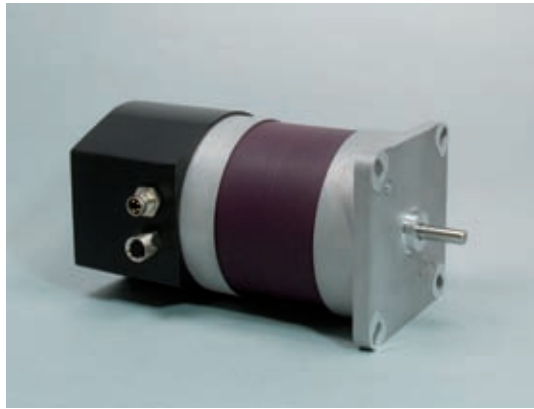


PHOTO: ROTEK

**The Rotak modular system enables many application-specific drive solutions.**

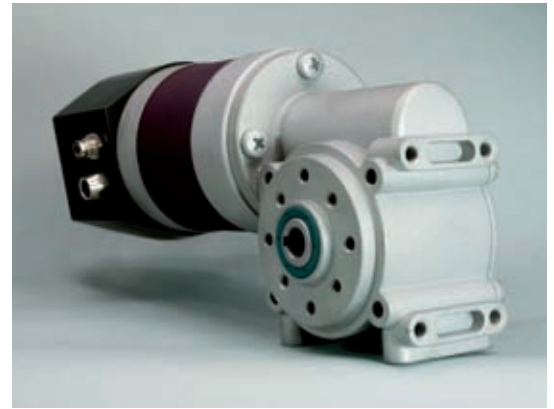


PHOTO: ROTEK

**In addition, worm and helical gear units are available.**



**Rolf Treusch, Managing Director of Rotek GmbH, Bremerhaven, Germany**

face offers the possibility to parametrise the electronics, i.e., to adapt to the application. This means that ramps, among other things, can be adjusted for acceleration and braking or the analogue nominal value set for the speed.

#### **Direct mains operation supported**

Additionally, the motors can be integrated via gateways with other bus systems such as CAN bus or Profibus and multiple motors can be interconnected. Direct mains operation via the single-wire bus is also available for use in customer-specific applications with multiple drives via software programming. This makes it possible for one drive to work in master mode with the others acting as slaves. The free ports can be used as inputs and outputs. This means that even the most complex

of processes can be implemented without separate electronics.

#### **Tailoring software for customers**

The software with a 2-quadrant speed controller offers a variety of functions and can be adapted to customer needs. Examples include:

- storing load characteristic maps
- integrating procedures for machines and equipment in line with customer specifications
- storing limits and parameters such as speed limits, ramps, currents, gear ratios, etc.

Initially, the motor is being offered with a maximum power output of up to 100 W. The speed range is 750 rpm to 4000 rpm, but this will be extended to cover a control range of 10:1 in the near future. Rotek are currently already working on a 48 V version which is twice as powerful. This is scheduled for availability in the course of the coming year.

#### **Impressing with variable speed**

Potential applications for the Romotion arise from its special properties. Its strengths come to play wherever torque-independent variable speed, high power density and durability are required. Even before its launch, the Romotion is attracting the interest of customers from the fields of intra-logistics, pumps, mechanical and equipment engineering.

The Rotak modular system enables various application-specific drive solutions. The drives are initially offered in connection with planetary gears. In addition, worm and helical gear units are available. And mechanical customisation is practically the norm for Rotek. (ud)

[www.rotok-motoren.de/site\\_en/w](http://www.rotok-motoren.de/site_en/w)

## KNOWLEDGE

### **30 years of motors from Bremerhaven**

Since it was founded in 1984 by Paul Hasselbach and Hans-Werner Kausch, Rotek has manufactured synchronous motors in Bremerhaven, Germany. This tradition has been continued by the Treusch family since 2000 with Rotek GmbH & Co. KG. Prof. Dipl.-Ing. Wilfried Treusch and his two sons Rolf and Klaus Treusch head the company. The product range includes small motors with synchronous technology from 10 W to 100 W that achieve a balance between functionality, durability and high power density. Powerful magnetic rotors and the effective winding of the coil body are what set them apart from other commercially available capacitors and three-phase motors. „Off-the-peg drives limit the designers creative options,“ Rolf Treusch is convinced. The Rotek modular system therefore empowers a large variety of custom solutions. „Because the drive is the heart of the machine,“ says Klaus Treusch, who is responsible for production, with particular emphasis on care and quality, „we check each motor individually.“ The motor's functionality is the priority for Wilfried Treusch, no matter for what purpose: „Whether conveyor belts with their energy efficiency, metering at constant speed, labelling with starts and stops at split second intervals or where you need to keep things particularly quiet, in labs for example“.