

Combining the good

EC drives with integrated electronic control will harmonize energy efficiency and power density

Modern drive technology needs characteristics akin to those of ravens: intelligence, communicative skills and flexibility.

Rotek's ›Romotion‹ electronic motor combines all these characteristics



► **RAVENS DIFFER FROM** other birds through skills which otherwise only primates possess. They have the ability to use tools and can assess social relationships between other ravens – a prerequisite to appropriate and clever conduct within complex social networks.

Today's modern drive technology should be just as adaptable: intelligent, communicative and highly flexible – these were Rotek's goals in Bremerhaven. Because drives need to optimally meet a diversity of demands under a wide range of environmental conditions. This flexibility should include mechanical design, electronics and fast service.

»Its strength lies in offering customized solutions to the wide range of our customers' need for drives.«

Dipl.-Oec. Rolf Treusch, Commercial Director
At Rotek in Bremerhaven



The end result: the ›Romotion‹ electronic motor introduced by the end of last year. Intelligent electronics offer potentials which exceed simple control of the motor winding by far. This allows the drive to autonomously assume functionalities of higher level controllers, rendering the latter dispensable or significantly simplified. This reduces the cost of plant design.

Its communicative skills are evident in warehouses. In rack loading systems, for instance, several motors may be networked via a CAN bus gateway to coordinate the execution of each motor's specific task. Also, should a mo-

tor need to be replaced, the CAN bus gateway will, after installation, detect and automatically parameterize the new drive. This saves valuable servicing time.

Stop position is reached without correction

When positioning boxes of varying weights with fast cycle times, the software may be programmed to approach the stop position optimally and without time consuming correction. The dynamic response of the system will be determined when the pallet is accelerated at maximum current.

This is used, whilst travelling at top speed, to calculate the load-dependent time required for deceleration. After active braking, the motor will change to stepper motor mode for the last 1° to 2° to approach stop position synchronously and highly over-excited. An output for braking resistors is a standard feature of the control electronics.

For a different application, in which a transport container must remain horizontal at all times, Rotek can offer a tilt sensor incorporated in the Romotion directly for electronic control. The drive may be calibrated during commissioning. This saves the manufacturer of the plant the effort of installing and wiring the sensor. Connecting the sensor directly to the motor controller furthermore ensures fast responses and thus particularly smooth travel.

For opening or closing of train windows, the entire control sequence may be located in the drive and the external sensors be wired to the correspondingly



Integrated intelligent controller, rendering higher level control superfluous: the Rotek Romotion motor

programmed motor controller inputs. Load limits may be parameterized, e.g. to ensure high starting torque when frozen or to reduce travelling current, to prevent mechanical damage.

Errors such as excessive travel time may be detected and reported. A cost-effective holding torque brake may be installed to prevent the window from opening inadvertently, operating without power, with no wear and absolutely failsafe.

The Romotion is a three-phase, brushless direct-current motor with integrated electronic controller. It operates without sensors in the basic version, offering two important advantages: The cost of sensors and wiring will fall away and the motor will run more smoothly, with absolutely identical torque in both directions.

The drive may receive its control signals either analog or via an integrated bus. The ModBus is standard and is used

for parameterization as well. CAN bus or Profibus are also options.

An analog input is provided for the speed set point and digital inputs are provided for enabling and for direction of rotation. Error and chopper outputs for braking are also integrated. Three unassigned digital inputs/outputs are in addition available, for use depending on application, such as to detect limit positions.

Convenient PC software for parameterization is offered free of charge, to use, for instance, to define ramps or to assign analog values to speed.

A version with Hall sensors is in development

Although the drive operates without sensors, it is also suited for simple positioning. Rotek will be offering a solution with integrated Hall sensors for more demanding applications. High resolution optical sensors or angle transmitters may optionally be fitted and connected to the unassigned controller inputs. For specific customer applications using several drives, the software may be programmed for direct networked operation via the single wire bus. One drive will in this case work in master mode and the others as slaves, whereby the unassigned connections may be used as signal inputs or outputs. Complex processes may in this way be implemented without a separate electronic controller.

Rotek also offers particularly cost-effective solutions with reduced range of functions, e.g. for driving a step conveyor. To extend the service life, a



The Romotion electronic motor with planetary gear



The Romotion electronic motor with worm gear

Torque Off (STO) safety function is also in preparation. Safety functions integrated directly into the drive would in fact reduce the cost of machines or plant directly. ■

INFO

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Delivery time: Small quantities 3 - 4 weeks, series production ca. 8 weeks
Available: directly from the manufacturer and via sales agents and distributors
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brushless motor is preferred here, instead of a normal DC motor. The required speed is set once, prior to installation. No control signals other than the enable signal are thereafter required when in operation, allowing particularly inexpensive wiring.

The motor is presently available for up to 100 W maximum output. The speed ranges between 750 and 4 000 rpm. Rotek is currently working on other, more powerful types for 24 V and 48 V. These are scheduled for release in autumn. Integration of the Safe

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