



Smooth running is our business

Electric motor manufacturer Rotek from Bremerhaven specialises in high quality, synchronous small motors. konstruktionspraxis took a look at the company's latest offering.

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Success stories are not always straightforward and, ultimately, success is typically attributable to multiple factors. A good example of this is the rise of the electric motor manufacturer Rotek from Bremerhaven, an acknowledged specialist in custom-made, high-quality, synchronous small motors and gear motor for specific applications.

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Today, the company supplies its energy-efficient motors to many countries in Europe and even to China. The modular system, now with more than one hundred thousand standard versions, leaves very little to be desired. „Our customers really appreciate our great flexibility, unbureaucratic processing, and short delivery times,“ as Rolf Treusch, who responsible for the commercial sector assures. Having said this, the most important foundation for a successful company is the pro-

duct quality - and Klaus Treusch is uncompromising here: „We sell reliability and pride ourselves in being able to tell our customers that they will have absolutely no worries with our drives, after installing them.“

Drive requirements are changing. Several years ago, Klaus Treusch, started to develop a new type of motor. Often ground-breaking inventions result from necessary practical considerations. The Rosync by the small electric motor manufacturer is one of these products. It is the first energy-efficient, small electric motor for AC applications worldwide. The developers achieved the excellent efficiency by using new materials and a special stator design.

For example, high-performance annular magnets from plastic bonded rare earth materials are used. The iron in the stator was reduced to the necessary minimum to leave as much space as possible for the coils. Optimised winding heads reduce the winding losses, which again helps to improve efficiency.

The result is an extraordinary level of efficiency, also in terms of consumption of raw materials. This design has now been patented under the name GreenDrive technology.

The new motor

But Rotek just can't stop innovating and has again developed a new motor: the new synchronous motor generation goes by the name of Roslyde. But what drives product development at Rotek? Klaus Treusch explains it like this: ideas focus internally, and market needs from the outside. The condi-



Roslyde: Rotek's new synchronous motor generation

Pictures: Rotek



Klaus Treusch, Technical Managing Director: „We sell reliability.“



The quiet solution: new Rotek Roslyde motor with planetary gear

tions: product development must be initiated from the outside, and it must be internally feasible. The boundary condition: it must match the assembly kit and it must be within the budget. „In order to make the running behaviour of the new motor as quiet and vibration-free as possible, we mainly worked on two tweaks: reducing the effect of alternating magnetic fields and minimising the standstill torque typical of synchronous motors“, he continues.

Since the rotor is ground between two peaks, it is already so well balanced that no further steps are necessary. And no changes were always needed, in the motor bearing area, as we always use high quality ball bearings with special lubrication. We pay particular attention to symmetrical bearing in high-precision machining of the bearing plates.

Of course, total silence is impossible

The drive is the heart of any machine. Thus, the quality of the drive used in a machine is of vital importance. But what actually makes the noise in an electric motor? First, there is always imbalance, which leads to frequencies that match the rotational speed. Even if you put much a huge amount of effort into balancing, there will still be a speck of dust. The next factor is then

typically ventilation. Since the Roslyde dispenses with fans, due to its excellent efficiency, this troublesome noise source can be avoided.

The bearings also generate vibrations, the more precise they are, the less noise there, but this is also a question of price. It is impossible to design absolutely silent gears.

In addition to the precision, the type of tothing in particular plays an essential role in the occurrence of noise. And then all the adjacent components come into play, such as housings, which act as a resonance chamber. Klaus Treusch explains: „The starting point for noise is the motor itself as a source of vibrations. Of course, the noise level of a drive depends to a great extent on the mechanical components, such as gears. You always need to look at the entire drive unit; after all, the majority of small motors is combined with a transmission.“ In the transmission, the vibrations are transmitted to the gear wheels. (Structure-borne sound is amplified by the transmission case just like the sound of a musical instrument is amplified by the resonance body vibrating.)

Lubricants also have big impact on reducing noise emission. To obtain an excellent acoustic pattern, Rotek offers various low-noise transmission solutions.

First and foremost, it is important that users perceive the sound as pleasant, or appropriate to the product. People mostly perceive high, shrill tones such as whistling and squeaking, or deep, rough sounds like buzzing and humming as unpleasant. For motors, uniform sounds without pronounced frequency fluctuations, and in which the high and low frequencies are not too dominant and individual tones are not too prominent, are optimal.

The goal is thus to achieve a very uniform, smooth purr. And Rotek has done a great job of achieving this with the new Roslyde motor series. Smooth drive technology makes the motor a very smooth runner.

- ▶ Starting point: motor variants with, for example, customised windings
- ▶ Selection and detailed design of the appropriate transmission
- ▶ Mechanical accommodation
- ▶ Accommodation of the power connector, e.g., special connectors
- ▶ Optional accessories such as encoders, etc.

Wilfried Treusch: „Looking forward, we will be venturing into what currently is unexplored terrain for us. Among other things we are working on BLDC motors and linear technology.“

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