

# Integration Nation

## Gearmotors handle harsh environments with digitalization, customization and improved service life

Matthew Jaster, Senior Editor

**It's 2020, so it comes as no surprise that mechanical components are smart, sophisticated and built to handle a variety of custom specifications.** For example, gearmotors for applications in material handling, food & beverage, packaging and industrial equipment are efficient, smaller, and more durable than their previous counterparts. Here's some gearmotor highlights from recent exhibitions and trade shows:

### EZ Series — Stober Drives

SPS—Smart Production Solutions (Germany, November 2019) featured a new generation of servo planetary gear units from Stober. These drives are compact, and any motor series can be directly attached in any available size. This variability allows Stober to create the right drive solution for any application. In contrast to the prior generation, Stober also equips the new planetary geared motors with an electronic nameplate, which makes commissioning controllers and drive controllers much faster. All Stober motors, such as the EZ series or sensorless lean motors, can be directly attached without an adapter, in any desired size.

Thanks to this compactness, the user benefits from a smaller installation space, lower weight, greater torque and a resulting power density that is increased by up to 65%. The mass moment of inertia is lower because the motor adapter is no longer needed, which allows the full dynamics of the drive to be used. This is a real advantage for the customer, particularly noticeable with small and medium sizes in shorter cycle times.

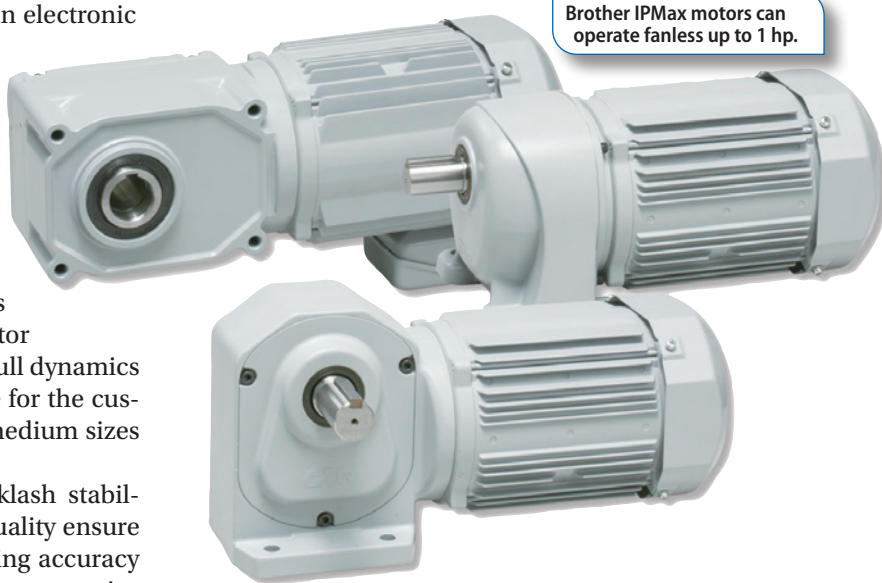
The new generation also features high backlash stability and ruggedness. The housing and gearing quality ensure high acceleration torques as well as high running accuracy and precision. Users benefit from acceleration torques increased by 60%, a speed increase of 45% and an increase of the torsional stiffness by up to 50%.

A noteworthy feature to this new generation of planetary gear units is its enormous variability. This means that not only are the gear units able to be combined with different Stober motors via direct attachment, they can also be attached to all third-party motors in any size using variable adapters. The drive specialist offers a one-of-a-kind interface technology for this purpose. Stober motor adapters are available with different couplings as well as in the ServoStop variant with an integrated brake. The adapters can also be combined with standard or reduced-play gear units. In particular, the large design of the Stober adapter with an extra-large motor plate makes it possible to connect the most

compact Stober gear units with motors of very large sizes—a truly unique selling point.

Another advantage is that the right bearing can be selected, whether deep-groove ball, cylindrical roller or angular contact bearing. These low-friction bearings enable generally higher speeds. Thanks to this enormous variety, engineers have all the options in the design phase to put together exactly the right drive solution for any application.

Additionally, thanks to Stober electronics, every geared motor automatically sends its electronic, mechanically relevant data by plug and play to the corresponding drive controller upon commissioning. As a result, the geared motors are uniquely identified. This eliminates high-effort, error-prone parameterization, which shortens the total system configuration significantly.

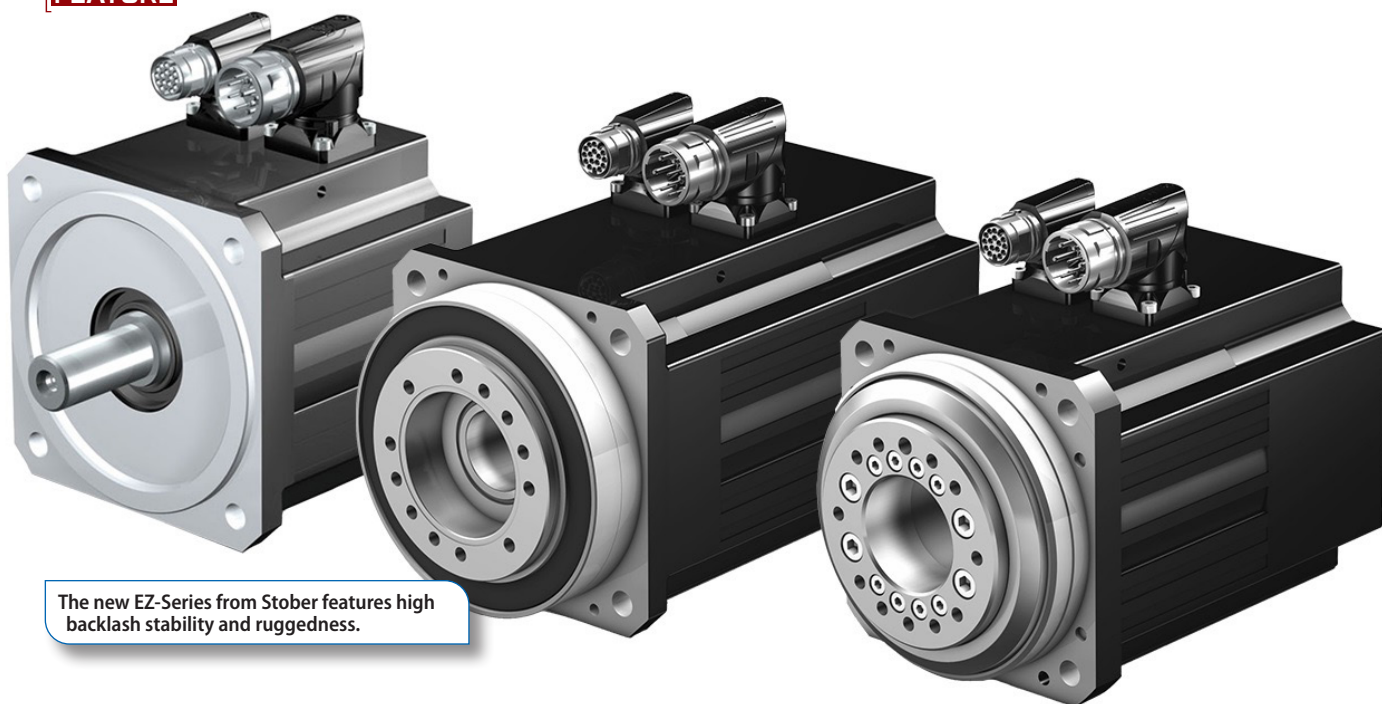


Brother IPMax motors can operate fanless up to 1 hp.

### IPMax Series — Brother Gearmotors

Matthew Roberson, vice president of Brother Gearmotors, discussed how the IPMax series ran at specified frequency commands regardless of load, making them highly reliable in demanding manufacturing environments. "IPMax offers near-constant power over a broad speed range and a magnet-retaining design."

Brother Gearmotors IPMax series incorporate magnets embedded within the rotor, as opposed to on the surface. No copper losses are experienced in the rotor, and considerably less copper losses occur in stator winding. The gearmotors can operate fanless up to 1 hp, and do not require encoders for sensor control. When stopped, a servo lock feature holds the motor in position.



The new EZ-Series from Stober features high backlash stability and ruggedness.

This line of lightweight, compact interior permanent magnet (IPM) gearmotors that are highly efficient with a wide synchronous speed range.

Brother's IPMax gearmotors are 23% smaller than comparable ie3 motors, and run 24% cooler for longer lifespan. They employ brake sequential—which sets motor operations when the mechanical brake is turned on or off—as well as a torque limit solution that protects the mechanical system. Various functions of their programmable I/O terminals may be changed according to external circuits or applications. RS485 is included as standard.

Interior permanent magnet motors are ideally suited for conveyors, fans, and pumps, and are frequently used for factory automation, material handling, packaging, and food processing.

In addition to reduced size and weight, Brother's IPMax gearmotors offer an ingress protection rating of 65 (IP65), meaning they are protected from total dust ingress as well as from low pressure water jets from any direction. Additionally, compared with a brushless DC gearmotor, the IPMax gearmotors feature simple wiring and are easier to connect. They also offer similar high efficiency without requiring any extra signal cable.

## Quantis - ABB

The Dodge Quantis Product Line from ABB is a modular gear drive engineered for flexibility and power density in a compact housing design. Common applications include belt conveyors, slide bed conveyors, mixer drives and general industrial machinery. They provide high torque density in a compact housing configuration. These reducers are available as gearmotors or B5 flanged input, and ship ready to install with factory-filled lubrication. A wide variety of mounting configurations and accessories make the Quantis an ideal solution for many industrial applications.

The Quantis product family includes four and five stages of gear reduction for all three types of gear arrangements; in-line helical (ILH), offset parallel (MSM) and right-angle helical bevel (RHB). Quantis reducers feature up to 98% efficient gearing and are available with integrated or flange mounted IE3 or NEMA Premium Efficient motors for an energy-saving package.

Quantis gearmotors are manufactured for long-lasting reliability with wear-free gear designs that are finish-ground with an ellipsoid tooth form. Standard units feature class 30



Euronorm has 100+ years of drive system experience.



gray iron gearcase housings, and all units are available with a two-piece harsh-duty output sealing system that provide industry-leading protection against contamination. E-Z Kleen corrosion-resistant, and Ultra Kleen all-stainless-steel units are available for the food and beverage industry.

Clamp style or 3-piece coupled inputs are available for easy motor installation and removal. For shaft-mounted applications, RHB and MSM styles feature the patented twin-tapered bushing system that makes it simple to install and remove the reducer from the driven shaft with no damage.

Whether the application requires the compactness of an integral gearmotor, the durability of a 3-piece coupling, or a separate shaft input for direct-coupled equipment, Quantis offers thousands of reducer configurations and bolt-on accessories to meet any need.

### Stainless Steel Gearmotors - Euronorm

Euronorm, located in the Netherlands, has more than 100-years-experience in the drive system industry. Starting out as a manufacturer of belts, the company continues to develop technologies in the fields of electric motors and various types of transmissions such as gearboxes, geared motors, linear actuators and planetary gearboxes. They recently exhibited some of these products and technologies during SPS - Smart Production Systems in (Germany, November 2019). Here are some examples of their gearmotor portfolio:

**Stainless Steel:** The stainless steel gearmotor from Euronorm is designed to meet HACCP and EHEDG guidelines. As a result, they withstand a thorough cleaning regimen and are made of hygienic components. Blind spots and horizontal surfaces are as much as possible avoided.

**ATEX:** Special measures are required for the use of a gearmotor in an ATEX environment (areas with potentially explosive air/gas or air/dust mixtures). These measures are defined in the ATEX 114 Directive (formerly ATEX 95). Euronorm has a wide offer of ATEX gearmotor types. Euronorm itself is ATEX certified for gearmotor types. Due to this, the gearmotor can be assembled from stock and combined with selected ATEX electric motors. Euronorm offers the full range (from 30Nm up to 4,300Nm) in ATEX from stock. The ATEX gearmotor is suitable for ATEX categories II2G, II2D, II3G-D, II3D and for use in zones 1, 21, 2 and 22.

**Helical:** The Euronorm helical gearmotor JRT R series is competitively priced, high quality and assembled from stock conform customer demands. The JRTR follows the industry standard for helical/coaxial gear. The JRT R helical gearmotor series are well compatible with other major brands, are assembled from stock and are competitively priced.

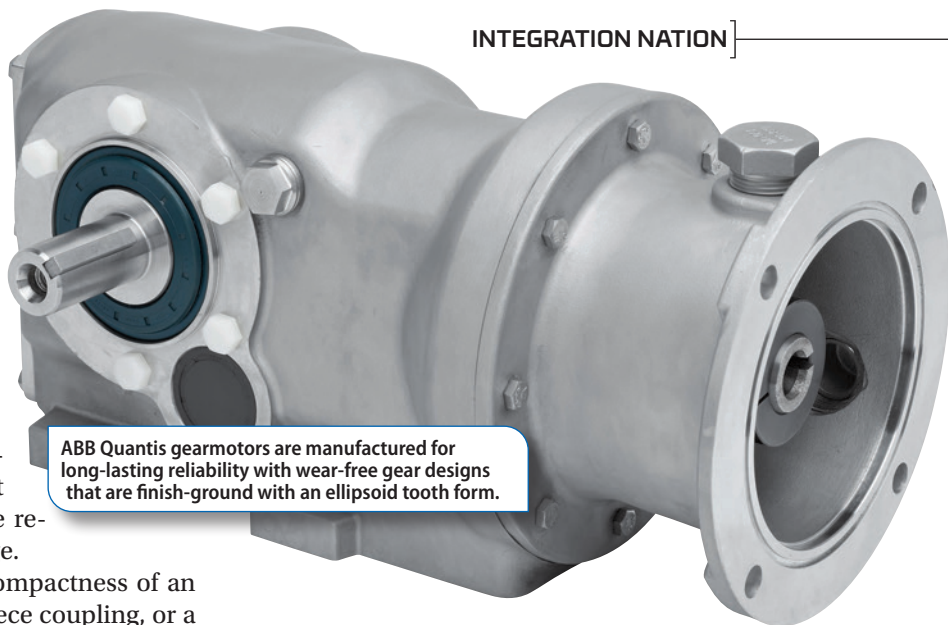


ABB Quantis gearmotors are manufactured for long-lasting reliability with wear-free gear designs that are finish-ground with an ellipsoid tooth form.

Euronorm offers different versions of helical gearmotor types, which are 1 on 1 interchangeable with SEW and other manufacturers.

**Parallel-Shaft:** The Euronorm parallel-shaft gearmotor types JRT F series are competitively priced, high quality and assembled from stock conform customer demands. The JRTF follows the industry standard for parallel-shafted gearmotor types. The JRT F series are well compatible with other major brands, are assembled from stock and are competitively priced. Euronorm offers different versions of parallel-shaft gearmotors, which are 1 on 1 interchangeable with SEW and other manufacturers. **PTE**

#### For more information:

ABB

Phone: (800) 435-7365  
[www.abb.com](http://www.abb.com)

Brother Gearmotors

Phone: (888) 523-6283  
[www.brother-usa.com/business/gearmotors-and-reducers](http://www.brother-usa.com/business/gearmotors-and-reducers)

Euronorm

Phone: +31 252 228850  
[www.euronormdrives.com](http://www.euronormdrives.com)

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## Back to Basics: Gearmotors

Since 1986, Power Electric has provided custom motor and gearmotor design, engineering and sourcing services to organizations in a wide range of industries. Here is some general information from Power Electric on gearmotors for those starting out in the mechanical power transmission market:

### What is a Gearmotor?

Gearmotors are basic in design, using some combination of plastic and/or metal. One of their greatest benefits is that they eliminate the need of having a separate gearbox and electric motor. The motor powers the gearbox, turning the box and creating energy. As a packaged set, they work together to increase torque (force) while keeping rpms (speed) low.

In most cases, the addition of a gearbox is intended to limit the speed of the motor's shaft and increase the motor's ability to output torque. Gears transform shaft speed into torque at specific ratios, with minimum efficiency losses, making it possible to create the ideal torque output and speed by adding the appropriately sized and configured gearbox.

### What Are the Different Gear Motor Types?

The two most common gearmotor types are right-angle gearmotors and inline gearmotors:

- Right-angle gearmotors use worm, bevel or hypoid gearing.
- Inline gearmotors typically use spur gears or planetary gear sets.

Of these five gear sets or gearings, the most common are worm, spur and planetary.

Gearmotors can be purchased with a variety of AC (alternating current) or DC (direct current) motor types. They also come in many reduction ratios to accommodate a vast number of applications such as automatic door operators, food & beverage equipment, and robotics.

Gearmotors are used in applications that require lower shaft speed and higher torque output. This describes a wide range of applications and scenarios, including many of the machines and equipment we interact with daily. From ATV wipers to hospital beds, servo mechanisms to packaging equipment, paint mixers to juice dispensers, gearmotors are used to power a significant number of machines and applications.

### What Applications DO NOT Use Gear Motors?

Due to the flexibility and widespread use of electric gearmotors, it is easier to explore applications that do not use them. Any application that requires high shaft speed will not benefit from the use of a gearmotor. This includes fans, pumps and engine starters. In these cases, the speed of the motor's shaft rotation is the most important factor. ([www.powerelectric.com](http://www.powerelectric.com))

### For Additional Information

To learn more Back to Basic articles on Product Selection & Sizing, Specifying Components, Electric Motors, Linear Motion, Bearings, Drives, Lubrication and more, be sure to visit our Back to Basics section on the PTE website at [www.powertransmission.com/subjects/basics/](http://www.powertransmission.com/subjects/basics/). **PTE**

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