The mechatronic drive system for completely new perspectives

MOVIGEAR®
Designers and operators of materials handling systems in many areas of logistics, such as the automotive, food and beverages industries, airport logistics or intralogistics, opt for drive solutions made by SEW-EURODRIVE. They choose innovative drive technology, highest product quality and consulting competence.

SEW-EURODRIVE offers a nearly unlimited selection of components and combination options for the implementation of countless individual applications. Perfectly matched drive components, including gearmotors, drive electronics and control options, are the heart of the materials handling system and ensure functionality and operating efficiency.

The latest in-house development of SEW-EURODRIVE is thus a logical consequence of our continuous development and research efforts especially in the field of decentralized drive technology. With MOVIGEAR®, the mechatronic drive system for horizontal materials handling technology, we set entirely new standards with respect to efficiency and functionality. MOVIGEAR® does not only combine the gear unit with a motor and matching drive electronics within one product. Above all, it makes optimum use of all technical and economic advantages of these three drive components.
MOVIGEAR® drive units

MOVIGEAR® is available in two sizes and two mechanical designs:
- MOVIGEAR® sizes
  - MGF.2 (torque class: 200 Nm)
  - MGF.4 (torque class: 400 Nm)
- MOVIGEAR® designs
  - MOVIGEAR® with hollow shaft and keyway
  - MOVIGEAR® with TorqLOC® hollow shaft mounting system

**Features and advantages**

- Compact design: Motor, gear unit and electronics are combined in a single mechatronic drive system
- Sizes
  - MGF.2 up to 200 Nm
  - MGF.4 up to 400 Nm
- Single line network installation principle: Only one cable has to be installed for energy and information transfer
- Simplified system planning and design
- Reduced number of versions
- Lower storage costs
- High degree of protection
- Hygienic surface design for applications in hygienic areas
- No air, dirt and germ swirls
- Reduction in energy costs due to high efficiency of all components (gear unit, motor, electronics)
- High degree of reliability due to systematic development of all components
- Reduction of total costs and operating costs of the materials handling system

**Examples:**
The following figure shows a MOVIGEAR® MGFT.2 unit with TorqLOC® hollow shaft mounting system and a MOVIGEAR® MGFA.4 unit with hollow shaft and keyway.
Greater energy efficiency for reduced energy and operating costs

Saving energy is not only an important contribution for protecting the environment, but it can also be measured financially. This inevitably affects the development of modern drive technology, because the drive components used and their overall efficiency play a major role in this.

A simple equation illustrates this:

\[ P_{\text{input}} = P_{\text{output}} + P_{\text{losses}} \]

This means that the costs for electrical energy input \( P_{\text{input}} \) are calculated from the effectively needed mechanical energy \( P_{\text{output}} \) plus losses \( P_{\text{losses}} \) resulting from the overall efficiency. Irrespective of the type of application or system, energy costs can only be reduced if energy losses during plant operation are kept as low as possible. This is why more and more system operators invest in the latest development from SEW-EURODRIVE. For them, the mechatronic drive system MOVIGEAR® is not only an investment in future-oriented and intelligent drive technology, but it also helps them to reduce energy costs immediately.

Verifi ed by an independent entity:
Energy saving potential of up to 50 %

“\textit{A comparison of the test results shows a significant efficiency advantage of the MOVIGEAR® drives … over the entire load range.}”

University of Applied Sciences of Kaiserslautern
Department of Applied Engineering Sciences
The mechatronic drive system MOVIGEAR® achieves such a high total efficiency due to:
- optimized interfaces between motor and gear unit
- permanent-field servomotor
- highly efficient gearings
- new electronic components and intelligent control modes.

The higher costs, compared to conventional drive solutions, are compensated within one or two years only by the saved energy expenses.

Reducing energy by increasing the overall efficiency

A current calculation example from a large bottling plant shows that the total efficiency of a drive solution with MOVIGEAR® is between 10 and up to 25 percentage points higher than that of conventional drive solutions, depending on the used gear unit type and the operating point.

If the 105 frequency-controlled standard gearmotors in this application, with a power rating between 1.1 and 2.2 kW, were replaced by corresponding MOVIGEAR® units, the energy costs could be reduced by 20 and 30 per cent on average.

Further energy saving aspects:
- The energy efficiency of MOVIGEAR® makes a sustainable contribution to the reduction of CO₂ emissions and thus actively protects the environment.
- MOVIGEAR® significantly reduces the reactive power consumption compared to motors operated directly on the mains supply and thus helps to ensure that reactive power limit values are observed.

Using MOVIGEAR® is not only an active contribution to preserving resources and the environment, but also enables the system operator to save a substantial amount of costs.
In addition to objectives such as “higher productivity” or “cost reduction”, the system environment is becoming a more and more important criterion for the development of modern machines and systems. Until now, compliance with normative limit values served as gauge for environmental impact for system operators. However, the creation of high-quality workplaces has become one of the key purchase criteria. This is why influences on the system environment, e.g. noise emission, are thoroughly analyzed.

The design without fan also reduces noise, since in conventional drives, a considerable amount of noise is created by air swirls and vibrations of the fan guard.
Hygienic Design for more product quality

Each end user is grateful to know that high demands are made concerning hygiene in all so-called “sensitive production areas.” This applies to employees as well as to all machines and systems involved. This approach is the only way to ensure that contaminated food products, cosmetics or drugs do not enter the market. That is particularly important for certain branches of industry, such as the beverage and food industry as well as the chemical and pharmaceutical industry. Often, regulations stipulate a completely germ-free environment.

The drive solutions used in the past made it very hard to clean the production systems as thoroughly as required. Standard drives often come equipped with cooling fins in which dirt can accumulate, and germs and bacteria may be distributed via air swirls.

This is where MOVIGEAR® with its smooth surface design comes in. The geometric design of MOVIGEAR® has complied with the Hygienic Design guidelines already during the design stage. This minimizes cleaning efforts, which leads to reduced cleaning and system downtimes and ultimately to reduced operating costs. The smooth surface design prevents the built-up of dirt; the units are virtually self-cleaning.

Surface protection

The totally closed mechatronic drive system applies the principle of surface cooling, dispensing with additional fans. Sucking in dirt and spreading germs and bacteria due to air swirls are a thing of the past. The high degree of protection ensures maximum reliability. And should it become necessary after all to replace the electronics, the upper part with the electronics can be separated from the connection part quickly and easily. Replacing the electronics part takes only a few minutes. Connection cables do not have to be removed, making for maximum system availability.

Thanks to these features, it is very easy to apply a decentralized installation philosophy even to sensitive production areas without additional effort for the cleaning of drive components.
With MOVIGEAR® SNI, completely new system concepts can be implemented, since energy and data are transferred via one standard cable. This principle is called Single Line Installation. Simplified installation leads to significantly reduced installation and system costs.

**Single Line Network Installation**

**MOVIGEAR® SNI**

**Properties:**
- Single control
- Reduction in the number of components
- Bus lines do not have to be routed in the field
- No risk of hidden faults in the bus cabling
- Reduced startup times
- Shorter project runtimes / lower project costs
- Integrated STO safety function

**Applications:**
- As a drive for applications with high breakaway and starting torques
- Conveyor systems with variable speeds
- As a drive for applications that require soft and/or defined start-up behavior
- As a group drive for easier implementation of synchronous operation

**Application examples:**
- Belt conveyors
- Pallet conveyors
- Roller and wheel conveyors
- Screw conveyors
- Container and packaging unit transports
- Chain and drag-chain conveyors
High performance and fast bus communication

MOVIGEAR® with SEW system bus allows for a functional integration of the mechatronic drive system in applications close to the machine. High performance and short response times distinguish this variant and enable reliable implementation of challenging drive tasks.

Installation topology with an SEW system bus controller

**MOVIGEAR® SEW system bus**
High performance and fast bus communication via CAN

**Characteristics:**
- Line wiring
- Single control
- Integrated communication interface
- Fast communication for short cycle times
- Hybrid cable for minimum installation effort
- System bus controller for control cabinet or fieldbus installation with integrated plc
- High drive dynamics and performance
- Integrated STO safety function

**Application options:**
- As drive for applications with high breakaway and starting torques
- As a drive for conveyor systems that must be operated dynamically at varying speeds
- Forming intelligent function groups
- Universal application due to large control range of 1:2000

**Application examples:**
- Palette conveyors
- Machine-integrated conveyor belts
- Feeding conveyors
- Synchronized feeder conveyors
- Reversing drives
Stand-alone operation

The mechatronic drive solution MOVIGEAR® binary was developed by SEW-EURODRIVE specifically for stand-alone solutions and applications with simple functionality. DIP switches and potentiometers allow for simple and fast startup, no PC required. The unit is controlled via the binary inputs either by a central PLC or in local/manual mode.

NEW: Installation topology with MOVIGEAR® binary

**MOVIGEAR® binary**

**Stand-alone operation**

**Features:**
- Simple startup without a PC using DIP switches and potentiometer
- Constant speeds and ramps can be configured
- Control of binary inputs and evaluation of signal relay via PLC
- On-site/manual operation via binary inputs
- Interface for diagnostics and parameter setting
- Integrated STO safety function

**Applications:**
- Basic stand-alone and individual applications
- For applications that require a soft start-up behavior
- Applications with two constant speeds
- For applications with high breakaway torques
- Applications with/without STO safety function

**Areas of application:**
- Simple conveyors
- Rotary tables
- Drives for infrequent speed variations
- Stirrers and mixers
- Crushers and shredders
- Presses
**MOVIGEAR® AS-Interface**

Basic, economical fi eldbus interface

**Features:**
- Constant speeds and ramps can be configured
- Control via standard AS-Interface specifications
- Connection of external sensors on the actuator
- Voltage supply for connected sensor technology
- On-site/manual operation via binary inputs
- Interface for diagnostics and parameter setting
- Integrated STO safety function

**Applications:**
- Basic fi eldbus interface
- For applications that require a soft start-up behavior
- Signal feedback from connected sensor technology
- For applications with expansive space requirements
- Applications with/without STO safety function

**Areas of application:**
- Accumulating roller conveyors
- Roller and wheel conveyors
- Pallet conveyors
- Rotary tables

**NEW: Installation topology with MOVIGEAR® AS-Interface**