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 beverage industries, airport logistics or intralogistics, opt for drive solutions made by SEW-EURODRIVE. They choose innovative drive technology, highest product quality and consulting competence.
The new mechatronic drive system MOVIGEAR® reduces total costs and operating costs also in your materials handling system.

SEW-EURODRIVE offers a nearly unlimited selection of components and combination options for implementing 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 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 in terms of efficiency and functionality. MOVIGEAR® not only combines 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®: Mechatronic drive system comprising motor, gear unit and electronics

<table>
<thead>
<tr>
<th>Features and advantages</th>
<th>MOVIGEAR® is basically available in two sizes and two mechanical designs:</th>
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<tbody>
<tr>
<td></td>
<td>MOVIGEAR® sizes</td>
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<tr>
<td></td>
<td>- MGF.2 (torque class: 200 Nm)</td>
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<tr>
<td></td>
<td>- MGF.4 (torque class: 400 Nm)</td>
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<tr>
<td></td>
<td>MOVIGEAR® types</td>
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<tr>
<td></td>
<td>- MOVIGEAR® with hollow shaft and key</td>
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<td>- MOVIGEAR® with TorqLOC® hollow shaft mounting system</td>
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- Compact design: Motor, gear unit and electronics are combined in one mechatronic drive system
- SNI principle (Single Line Network Installation): Only one cable has to be installed for energy and information transfer
- Simplified system planning and design
- Reduced number of variants due to wider setting range and universal mounting position
- Lower storage costs
- High degree of protection
- Hygienic surface design for applications in hygienic areas
- No air, dirt and germ swirls
- Reduced energy costs due to high efficiency of all components (gear unit, motor, electronics)
- High degree of reliability due to systematic development of all components
- Reduced total costs and operating costs of the materials handling system

MGFT.2 and MGFA.4 (examples)
The following figure shows a MOVIGEAR® MGFT.2 mit TorqLOC® hollow shaft mounting system and a MOVIGEAR® MGFA.4 with hollow shaft and key.
## Application options

The following types of electronics covers are available for all sizes of MOVIGEAR® DSC-B and MOVIGEAR® SNI-B units:

- Electronics cover without application slot
- Electronics cover with application slot

The electronics cover of MOVIGEAR® DBC-B and MOVIGEAR® DAC-B is designed without application slot.

### Application options

Application options are installed in the application slot of MOVIGEAR®. These options implement specific interfaces, such as binary inputs or binary outputs. The energy supply of the option as well as the communication between MOVIGEAR® and the option are contactless.

#### GIO12B application option

The GIO12B application option allows for controlling up to 2 digital actuators and for processing up to 4 digital sensors.

#### GIO13B application option

The GIO13B application option comes equipped with the following interfaces:

- 1 digital output
- 4 digital inputs (two of them can be used as primary frequency input)
- 1 analog output
- 1 analog input
Greater energy efficiency for reducing energy and operating costs

Using any opportunity to save energy is not only an important contribution to conserve the environment but also pays off financially. This also affects the development of modern drive technology. The drive technology used and its overall efficiency play a major role in this approach.

A simple equation illustrates this:

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

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

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

“...a comparison of the test results shows a significant efficiency advantage of the MOVIGEAR® drives … over the entire load range.”
The mechatronic drive system MOVIGEAR® achieves the high total efficiency due to:
- optimized interfaces between motor and gear unit
- permanent-field synchronous motor
- highly efficient gearings
- new electronic components and intelligent control modes.

Highest motor efficiency due to permanent-field synchronous motor. Already today, the motor efficiency complies with the planned efficiency class IE4 (Super Premium Efficiency) of the international standard IEC 60034-7-30.

Solution for horizontal transport
Latest measurements on a belt conveyor of a baggage handling system in airport logistics show the following:*:
- Average reduction of power consumption by approx. 4400 kWh/a per drive
- Reduction of energy consumption by 55%
- Reduction of CO₂ emission of 2391 kg/a per drive
- € 536 of energy saved per drive/year

Compared to conventional drive solutions, the higher costs of the drive components already pay off within one or two years due to the saved energy costs.

Other energy saving aspects:
- The energy efficiency of MOVIGEAR® makes a sustainable contribution to reducing CO₂ emissions and in this way actively protects the environment.
- MOVIGEAR® significantly reduces the reactive power consumption compared to motors operated directly on the supply system and so helps to ensure compliance with reactive power limit values.

Using MOVIGEAR® is not only an active contribution to conserving resources and the environment but also enables system operators to save a substantial amount of costs.

*Calculation based on customer data with energy costs of 0.122 €/kWh and a runtime of 18 hours per day and 365 days per year.
Solutions for sensitive areas

Low noise emissions improve the quality of the workplace

In addition to the 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 has served system operators as a gauge for determining the environmental impact. In the meantime however, the creation of high-quality workplaces has become one of the key purchase criteria. This is why the 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 caused by air swirls and vibrations of the fan guard.
Clean room variant

Energy-efficient drive solutions with MOVIGEAR® are now also possible up to cleanliness class 2*. The compact and easy to clean design meets the demanding hygienic requirements on air quality as well as the permitted amount and size of particles released. At the same time energy consumption is reduced by up to 50% compared to conventional drive technology used for such applications.

This mechatronic drive system will open up entirely new energy-saving potential for the production and logistics plants of many machine and system operators. Examples:

- Food industry
- Chemical, pharmaceutical and cosmetic industries
- Biotechnology and medical technology
- Semiconductor industry and solar panel production
- and many more.

* meets ISO 14644-1

The Fraunhofer Institute certifies that the MOVIGEAR® drive for clean room applications meets the requirements up to air cleanliness class 2 according to ISO 14644-1, depending on the motor speed, and that the drive can be operated in such applications.
Every end user is grateful to know that high demands are placed on hygiene in all so-called “sensitive production areas.” This statement applies to employees as well as 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 even stipulate a completely germ-free environment. The drive solutions used in the past made it very difficult 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 are distributed via air swirls.

This is where MOVIGEAR® with its smooth surface design comes in. The geometric design of MOVIGEAR® was based on the Hygienic Design guidelines already during the concept stage. This minimizes cleaning efforts, which leads to reduced cleaning and system down-times and ultimately to reduced operating costs. The smooth surface is virtually self-cleaning as it prevents dirt from adhering to it.

Surface protection

The completely enclosed mechatronic drive system uses surface cooling and does not require 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 so that maximum system availability is ensured.

Thanks to these features, it is very easy to apply a decentralized installation philosophy even to sensitive production areas without additional effort required for cleaning drive components.
Optimum solution for wet areas

The mechatronic drive system MOVIGEAR® for applications in wet areas is specifically intended for permanently wet areas. For hygienic areas in the food and beverage industry with regular acidic and caustic wet cleaning. Antistick properties support the cleaning process even in inaccessible areas.

Sample applications:
- Hygienic and aseptic conveyors in the beverage industry
- Systems in cheese dairies and butcher shops
- "Splash zones" in the food industry

Overview of the features:

<table>
<thead>
<tr>
<th>Design</th>
<th>The smooth overall design and the compact unit comprising gear unit, motor, and electronics facilitates thorough cleaning of the entire drive system and results in a reduced emission of particles. At present available in two sizes covering a torque range from 20 Nm to 400 Nm.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special anti-stick surface HP200</td>
<td>Makes for easier cleaning prevents paint flaking at the interfaces as the surface is treated prior to assembly and burnt into the housing material prevents particles from sticking to the surface is resistant against mechanical stress and common cleaning agents</td>
</tr>
<tr>
<td>No fan</td>
<td>No swirling of air, dirt, and particles reduction in noise emission allows for complying with noise limits at the workplace</td>
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<tr>
<td>Cost-effectiveness</td>
<td>Reduction in energy costs by up to 50% due to high overall efficiency</td>
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With MOVIGEAR® SNI, completely new system concepts can be implemented because energy and data are transmitted using one standard cable. This principle is referred to as Single Line Installation. Simplified installation leads to significantly reduced installation and system costs.

**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
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 is required. The unit is controlled via the binary inputs either by a central PLC or in local/manual mode.

**Stand-alone operation**

**Features:**
- Simple startup without a PC using DIP switches and potentiometers
- 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
Efficient fieldbus connection

MOVIDRIVE® AS-Interface for simple fieldbus connection via standard AS-Interface. Parameterizable fixed speeds and ramps, integrated STO safety function and connection options for external sensors ensure fast and extremely efficient implementation of material handling systems.

Installation topology with MOVIDRIVE® AS-Interface

MOVIDRIVE® AS-Interface
Basic, economical fieldbus 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 fieldbus 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
SEW-EURODRIVE is right there for you:

**Argentina**
Phone: +54 3327 4572-84
Fax: +54 3327 4572-21
sewar@sew-eurodrive.com.ar

**Australia**
Phone: +61 3 9933-1000
Fax: +61 3 9933-1003
enquires@sew-eurodrive.com.au

**Austria**
Phone: +43 1 617 55 00-0
Fax: +43 1 617 55 00-30
sew@sew-eurodrive.at

**Belarus**
Phone: +375 17 298 38 50
Fax: +375 17 298 1898
sales@sew.by

**Belgium**
Phone: +32 16 386-311
Fax: +32 16 386-336
info@sew-eurodrive.be

**Brazil**
Phone: +55 11 2489-9133
Fax: +55 11 2480-3328
sewb@sewb.com.br

**Canada**
Phone: +1 805 791-1553
Fax: +1 805 791-2999
marketing@sew-eurodrive.ca

**Chile**
Phone: +56 2 75770-00
Fax: +56 2 7577-01
ventas@sew-eurodrive.cl

**China**
Phone: +86 22 25322812
Fax: +86 22 25323273
info@sew-eurodrive.cn

**Colombia**
Phone: +57 1 54750-50
Fax: +57 1 54750-44
sewcol@sew-eurodrive.com.co

**Czech Republic**
Phone: +420 255708061
Fax: +420 220121237
sew@sew-eurodrive.cz

**Denmark**
Phone: +45 43 9595-00
Fax: +45 43 9585-09
sew@sew-eurodrive.dk

**Finland**
Phone: +358 201 589-300
Fax: +358 3 7806-211
sew@sew.fi

**France**
Phone: +33 3 88 73 67 00
Fax: +33 3 88 73 66 00
seu@seu.com

**Great Britain**
Phone: +44 1924 893-655
Fax: +44 1924 893-702
info@sew-eurodrive.co.uk

**Hong Kong**
Phone: +852 36902200
Fax: +852 36902211
contact@sew-eurodrive.hk

**Hungary**
Phone: +36 1 437 06-58
Fax: +36 1 437 06-50
office@sew-eurodrive.hu

**India**
Phone: +91 265 2831086
Fax: +91 265 2831087
mdoffice@sew-eurodriveindia.com

**Italy**
Phone: +39 02 96 9801
Fax: +39 02 96 799781
sew@sew-eurodrive.it

**Japan**
Phone: +81 538 373811
Fax: +81 538 373814
sew@sew-eurodrive.co.jp

**Kazakhstan**
Phone: +7 727 334 1880
Fax: +7 727 334 1881
sew@sew-eurodrive.kz

**Korea**
Phone: +82 31 492-8051
Fax: +82 31 492-8056
master.korea@sew-eurodrive.com

**Malaysia**
Phone: +60 7 3549409
Fax: +60 7 3541404
sales@sew-eurodrive.com.my

**Mexico**
Phone: +52 442 1030-300
Fax: +52 442 1030-301
scmexico@seweurodrive.com.mx

**Netherlands**
Phone: +31 10 4463-700
Fax: +31 10 4155-552
info@sew-eurodrive.nl

**New Zealand**
Phone: +64 9 2745627
Fax: +64 9 2740165
sales@sew-eurodrive.co.nz

**Norway**
Phone: +47 69 241-020
Fax: +47 69 241-040
sew@sew-eurodrive.no

**Peru**
Phone: +51 1 3496280
Fax: +51 1 3496002
sewperu@sew-eurodrive.com.pe

**Poland**
Phone: +48 42 6763500
Fax: +48 42 6763545
sew@sew-eurodrive.pl

**Portugal**
Phone: +351 21 30 9670
Fax: +351 21 30 9685
info@sew-eurodrive.pt

**Russia**
Phone: +7 812 3332522
Fax: +7 812 3332523
sew@sew-eurodrive.ru

**Singapore**
Phone: +65 66621701
Fax: +65 66612827
sewsingapore@sew-eurodrive.com

**South Africa**
Phone: +27 11 248-7000
Fax: +27 11 494-3104
info@sew.co.za

**South Korea**
Phone: +82 31 492-8051
Fax: +82 31 492-8056
master.korea@sew-eurodrive.com

**Spain**
Phone: +34 94 4318470
Fax: +34 94 4318471
sew.spain@sew-eurodrive.es

**Sweden**
Phone: +46 36 344200
Fax: +46 36 344280
info@sew-eurodrive.se

**Switzerland**
Phone: +41 61 41717-17
Fax: +41 61 41717-00
info@imhof-sew.ch

**Thailand**
Phone: +66 22 454281
Fax: +66 22 454286
sewthailand@sew-eurodrive.com

**Turkey**
Phone: +90 216 4419163
Fax: +90 216 3055867
sew@sew-eurodrive.com.tr

**Ukraine**
Phone: +380 56 370 3211
Fax: +380 56 372 2078
sew@sew-eurodrive.ua

**Uruguay**
Phone: +598 2 21181-89
Fax: +598 2 21181-90
sewuy@sew-eurodrive.com.uy

**USA**
Phone: +1 864 439-7537
Fax: +1 864 439-7830
calymann@sew-eurodrive.com

**Uruguay**
Phone: +598 2 21181-89
Fax: +598 2 21181-90
sewuy@sew-eurodrive.com.uy

**Venezuela**
Phone: +58 241 832-9804
Fax: +58 241 838-6275
ventas@sew-eurodrive.com.ve

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SEW-EURODRIVE GmbH & Co KG
P.O.Box 30 23
76642 Bruchsal/Germany
Phone: +49 7251 75-0
Fax: +49 7251 75-1970
sew@sew-eurodrive.com

www.sew-eurodrive.com