SEW EURODRIVE

Modular, Flexible, Economical

Drive Components and Solutions for Decentralized Drive Systems

Decentralized Implementation of Economical Automation Concepts

In many industries and applications, realizing economical automation concepts means implementing decentralized systems throughout. Long rows of control cabinets with complex wiring, expansive space requirements and long distances between control cabinet and motors are too rigid and not very economical.

Drive components and solutions for decentralized drive systems are:

Modular | **Flexible** | **Economical**

Only the combination of flexible, versatile, economic and target-oriented modules will provide an efficient solution. That is the reason why system operators opting for decentralized drive systems from SEW-EURODRIVE are always ahead of the game. Whether in the automotive, beverage and food industries or in transport logistics and packaged goods handling: All decentralized components from SEW-EURODRIVE fulfill the three most important criteria for use in automation applications: They are modular, flexible and economical.

With
- the new MOVIFIT® drive control for innovative field installations,
- MOVIMOT®, the gearmotor with integrated frequency inverter,
- MOVI-SWITCH®, the gearmotor with integrated switching and protection function,
- and the specifically developed field distributors and cable systems,

additional central switching and protection units and electronic control devices become obsolete; the required control cabinet space is reduced significantly. Let alone the savings in the so far very cost and time consuming wiring of motors, sensors and actuators. Of course, these components can be installed in any commercial bus system. For faster, more economical and flexible decentralization.

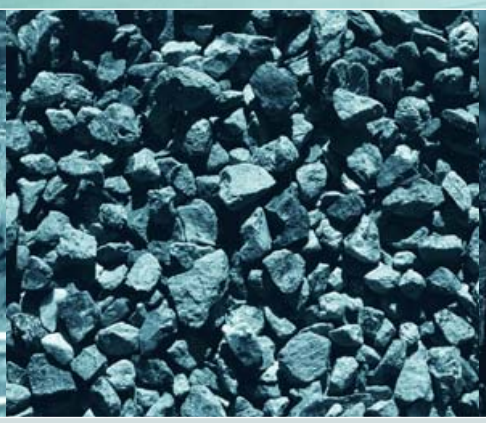
Driving the world – with innovative drive solutions for all branches of industry and for every application. Products and systems from SEW-EURODRIVE for any application – worldwide. SEW-EURODRIVE products can be found in a variety of industries, e. g. automotive, building materials, food and beverage as well as metal-processing. The decision to use drive technology "made by SEW-EURODRIVE" stands for safety regarding functionality and investment.

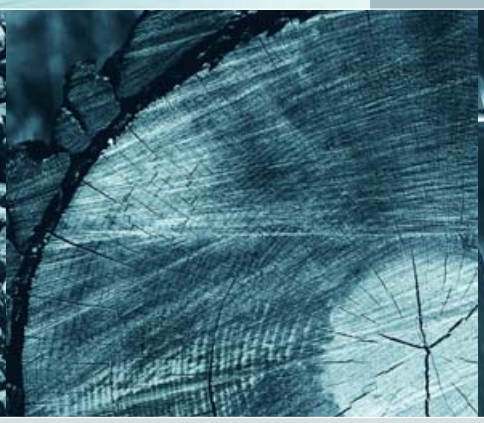
Complicated and Time-Consuming Solutions are a Thing of the Past

The savings realized with the unified system solutions for decentralization from SEW-EURODRIVE start as early as the planning stage of the drive solution. The modular design can be easily and quickly altered to accommodate future changes and additions. Flexible adaptation to all process and spatial conditions can be achieved without any difficulty.

Standard fieldbus systems take over the job of communicating with the central controller. Several motors can be easily linked with the energy bus and fieldbus by means of the installed field distributors and system connections.

SEW-EURODRIVE not only reduces the number of components, but constantly develops more compact and efficient drive systems. Right from the start or from the time a system is modernized or converted: Decentralized drive technology from SEW-EURODRIVE makes for modular, flexible and economical systems.





MOVIFIT® Drive System for Innovative Field Installations

The new MOVIFIT® systems combine the well-known advantages of SEW-EURODRIVE's decentralized installation technology with modern, application-oriented drive and communication functions.

In doing so, MOVIFIT® fulfills the current demands of plant manufacturers and operators: e.g. for reduced unit costs, installation times and startup efforts, for "ready-to-use" and flexible conveying functions, for optimized system topologies, for a high degree of integration or for food-grade unit designs.

MOVIFIT® is:

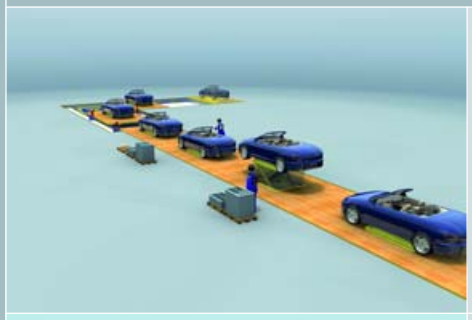
Modular	Flexible	Economical
– Three unit variants are available – New power electronics with frequency inverters and motor control switches – High level of integration	– State-of-the-art connection technology makes for fast installation and startup, a high degree of serviceability and ease of diagnostics, also when replacing the electronics – Support of new strategies for optimized system topologies – Communication via all commercial fieldbus systems, including ETHERNET – Various areas of application	Reduced investment and operating costs and project planning times: – Standardized conveyor elements – Well-structured, functional system topology – Modular, decentralized concept allows for quick and easy expansion of a system should this become necessary – Reusability of the modules reduces project planning costs and times – A decentralized electronics unit enables control of several drives, which reduces the number of units – Minimizes the space required in the control cabinet – Minimizes error sources during wiring – MOVIFIT® Hygienic^{Plus}: Standard design for use under special ambient conditions, e.g. in wet areas

MOVIFIT®, the drive control for innovative field installation: Already at the project planning stage, this entirely successful concept saves a substantial amount of time and money, eventually reducing investment and operating costs significantly.

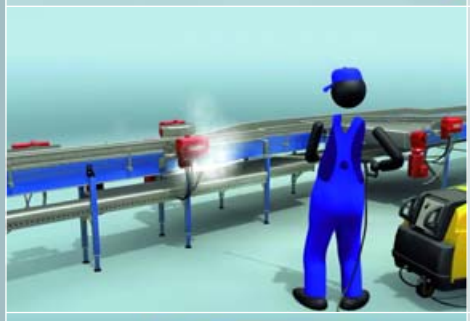
MOVIFIT®: Diverse Areas of Application due to Flexible Installation Technology

Horizontal or vertical conveying technology, belt or chain conveyors, elevating or rotary tables: the requirements on a drive system are diverse and demanding.

No problem for the MOVIFIT® system from SEW-EURODRIVE: With its flexible installation technology, the system sets new standards resulting in more efficiency in component and system planning. The system is really simple: It is a modular system enabling the electronics and connection units to be combined and configured to match the requirements of the application and the installation concept, for example



– In the automotive industry in the body shop or in the final assembly



– In the food and beverage industry in baking lines, in meat or poultry conveyor systems, as well as in beverage conveyor belts both in dry and wet areas

– In logistics in conveyor systems and storage and retrieval units

The Variant for the Food Industry

The MOVIFIT® Hygienic^{Plus} design fulfills highest demands for leak-tightness as well as the special hygienic cleaning standards of the food and beverage industry:

– Housing design and inspection window meet the requirements for degree of protection IP69K
– The special housing surface makes
  - Easy cleaning due to self draining design: cleansing agents and water do not adhere to the unit or leave any traces (self-draining)
  - Meets standards for hygienic criteria according to DIN EN 1672-2 and DIN EN ISO 14159
– Cleaning agent compatibility: Disinfectant cleaning agents containing alkali and acids can be used without any problems
– Anti-adhesive properties
– Surface highly resistant against mechanical impacts
– Insensibility to temperature fluctuations: Condensation and suction effect (pressure compensation possible)

MOVIFIT® Designs

MOVIFIT® MC

- Up to three MOVIMOT® to be connected via hybrid cable
- Voltage range 3 x 380 ... 500 V
- Integrated power distribution and line protection
- Integrated communication interface
- Maintenance switch
- "Safe stop" function
  - Safety category 3 to EN 954-1
  - Stop category 0 according to EN 60204-1
  - Optional stop category 1 according to EN 60204-1
- 12 digital inputs + 4 digital inputs/outputs
- CAN/SBus interface for external components
- Simple and fast parameter setting via DIP switches or fieldbus

MOVIFIT® SC

- Electronic (contactless) motor starter
  - Connection of two motors (dual motor starter) ➞ one direction of rotation
  - Connection of one motor (reversing starter) ➞ two directions of rotation
- Power range
  - with connection of two motors / ➞ 2 x 0.37 to 2.2 kW
  - with connection of one motor / ➞ 1 x 0.37 to 4.0 kW
- Adjustable soft startup time
- Voltage range 3 x 380 … 500 V
- Increased safety by switching of three phases
- Integrated energy distribution
- Integrated brake management for SEW three-wire brakes
- Optional maintenance switch
- Integrated communication interface
- Digital inputs/outputs
  - 6 DI + 2 DI/O with Classic function level
  - 12 DI + 4 DI/O with function level Technology or System
- CAN/SBus interface for external components
- Simple and fast parameter setting via DIP switches
- Expanded parameter setting via fieldbus or diagnostics interface

MOVIFIT® Designs

MOVIFIT® FC

- Configurable (open-loop) frequency inverter
- Power range from 0.37 to 4 kW (in two sizes)
- Voltage range 3 x 380 … 500 V
- Integrated energy distribution
- Integrated brake management for SEW three-wire brakes
- Optional internal braking resistor (integrated in ABOX)
- Optional external braking resistor
- Optional maintenance switch
- Integrated communication interface
- Digital inputs/outputs
  - 6 DI + 2 DI/O with function level Classic
  - 12 DI + 4 DI/O with function level Technology or System
- CAN/SBus interface for external components
- "Safe stop" function
  - Safety category 3 to EN 954-1
  - Stop category 0 according to EN 60204-1
  - Optional stop category 0 according to EN 60204-1
- Simple and fast parameter setting via DIP switches
- Expanded parameter setting via fieldbus or diagnostics interface

MOVIFIT® function levels

The function level indicates the functions included in the software for MOVIFIT® units regarding
- Operation
- System control
- Diagnostics

Overview of MOVIFIT® function levels

Classic Simple functions	**Technology** Free programming (MOVI-PLC®/MOVITOOLS® MotionStudio)	**System** Drive-oriented conveyor functions (MOVIVISION®)
– Control as fieldbus gateway via MOVILINK® – Simple handling and functionality, can be compared with control of SEW field distributors (Z.3, Z.6 etc.)	– Programming takes place according to IEC 61131 (e.g. in LD, FBD, IL, ST, AS) – MOVITOOLS® MotionStudio with PLC Editor, Application Builder, etc. – Multi-stage library concept	– Central data storage and management – Central parameter and diagnostics system with the configurable MOVIVISION® system software – Configurable, drive-oriented conveyor functions – Simple, intuitive operation for system operators

Communication via fieldbus: PROFIBUS, PROFINET, PROFIsafe, DeviceNet, ETHERNET IP

MOVIMOT® – One Drive that Combines Mechanics and Electronics

MOVIMOT® is the success product in decentralized drive engineering: the ingeniously simple idea of combining a gearmotor with integrated frequency inverter in the power range of 0.37 to 4.0 kW. Despite the integrated frequency inverter, the unit needs only a minimum of additional space compared to the standard gearmotors and can be supplied in all standard versions and mounting positions with and without brake for supply voltages of 380 to 500 V and 200 to 240 V.

The plug-in type inverter makes for quick installation and can be easily replaced in case of a service call. SEW-EURODRIVE offers an optional SafetyDrive package to equip plants with functional safety concepts.

MOVIMOT®, the gearmotor with integrated frequency inverter. The heavy-duty and compact version for a number of decentralized drive solutions with standard integrated control, protection and monitoring functions.

Always One Step Ahead

The revised MOVIMOT® D is SEW-EURODRIVE's next, future-oriented chapter of this success story. Consequent further development of the gearmotors with integrated frequency inverter of the MOVIMOT® D series ensured that already today the challenging requirements of a successful energy balance are fulfilled. MOVIMOT® D can be combined with the new energy efficient motors of the DR series that already today meet the efficiency level required by the premium efficiency classification (IE3).

It goes without saying that the new MOVIMOT® D can be combined with the proven DT/DV motor series as usual.

MOVIMOT® is:

Modular	Flexible	Economical
– Gearmotor and drive electronics combined in a robust and compact housing – Infinitely variable speed up to 1:10 with constant torque – Vector-oriented motor control and four-quadrant operation with or without mechanical brake – Communication with the controller takes place either via the serial RS-485 interface or optionally via all commercial fieldbus interfaces (PROFIBUS, PROFIsafe, INTERBUS, DeviceNet, CANopen, or AS-Interface). – Available in all gear unit designs and mounting positions of the modular system up to degree of protection IP66 – Can be used with all standard power supply systems, worldwide	The MOVIMOT® series allows for more flexible and demand-oriented adjustment to the – application requirements, – ambient conditions on site, – space available for the installation, and – safety-oriented communication via PROFIsafe field distributors	– Saves control cabinet space – Minimizes cabling effort and costs – Integrated frequency inverter: Additional electronic controllers are no longer required – MOVIMOT® D in combination with the DRE energy efficient motor: The efficiency levels reached by the motors meet, and sometimes even exceed, the international requirements on limit values as well as the IE1, IE2 and IE3 standards.

MOVIMOT®

Available motor power ratings	0.37 / 0.55 / 0.75 / 1.1 / 1.5 / 2.2 / 3 / 4 kW
Speed setting ranges	280 ... 1400 (1700) 1/min and 290 ... 2900 1/min
Approbation	IEC / c UL us
Connection voltage [V]	3 x 380 ... 500 V ± 10 % / 50/60 Hz 3 x 200 ... 240 V ± 10 % / 50/60 Hz
Motor frequency range [Hz]	2 ... 100 Hz
Control supply voltage	24 V_{DC} external, local supply available as option
Enclosure	IP54, optional IP55, IP65, IP66
Ambient temperature	-30°C/-20°C to +40°C (depending on the motor design)
Control via binary signals	Entry for cw/stop, ccw/stop, setpoint switch mode isolated signal relays, 2 fixed setpoints, 1 ramp for acceleration and deceleration
Control via fieldbus communication	In combination with fieldbus interfaces, with and without minicontroller PROFIBUS, PROFIsafe, INTERBUS, INTERBUS LWL, DeviceNet, CANopen, AS-Interface
Use in stand-alone applications	In combination with the options: MLU.1A: Local 24 V_{DC} supply MLG.1A: Local supply with 24 V_{DC} supply MBG11A: Speed control module for setpoint frequency specification and display MWA21A: Setpoint converter for interfacing of analog setpoints (0... 10 V, 0 ... 20 mA, 4 ... 20 mA) and RS-485
Use in decentralized installations	In combination with field distributors: MF.../Z.3. MF.../Z.6. MF.../.../Z.7. MF.../.../Z.8. as well as the corresponding hybrid cables
Diagnostics	3-color LED signals operating status and fault status via diagnostics interface, serial interface RS485 and option MDG11A or PC

MOVI-SWITCH® – Integrated Switching and Protection Functions

MOVI-SWITCH® is an efficient solution when it comes to decentralization at power levels up to 3 kW: The gearmotor with integrated switching and protection function does not take up space in the control cabinet and does not require any cabling apart from the supply and control voltage. Control for one or two directions of rotation, thermal motor protection and AS-Interface as an option are integrated in the motor. In addition to that, this gearmotor impresses by its compact and robust design.

The SEW-EURODRIVE modular system is a key contributor also to the success of MOVI-SWITCH®: All AC motors and brakemotors can be combined with all matching gear units. Brake control is integrated into all brakemotors as standard for shortest response times for releasing and applying the brake. MOVI-SWITCH® can be combined with the new energy efficient motors of the DR series that already today meet the efficiency level required by the premium efficiency classification (IE3).

MOVI-SWITCH® is available with enclosures up to IP65 in all gear unit variants and mounting positions.

MOVI-SWITCH® ensures safety and functionality: Switching and protection functions are integrated in the motor terminal box; no additional space in the control cabinet or cabling effort are required.

MOVI-SWITCH® is:

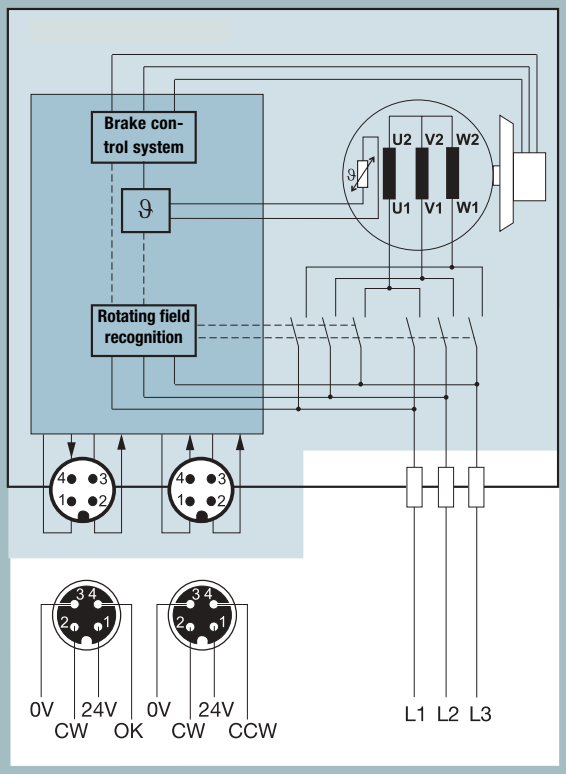
Modular	Flexible	Economical
Available in two designs: – MOVI-SWITCH®-1E: On/off one direction of rotation / contactless star bridge connector – MOVI-SWITCH®-2S: On/off two directions of rotation / switching element with contact	– Opens up new application areas – Fast configuration due to simple control – Simplifies maintenance	– Saves control cabinet space – Minimizes cabling effort and costs – Simple startup: Supply and control connection for motors with or without brake is the same – No additional switching and protection devices necessary

MOVI-SWITCH®

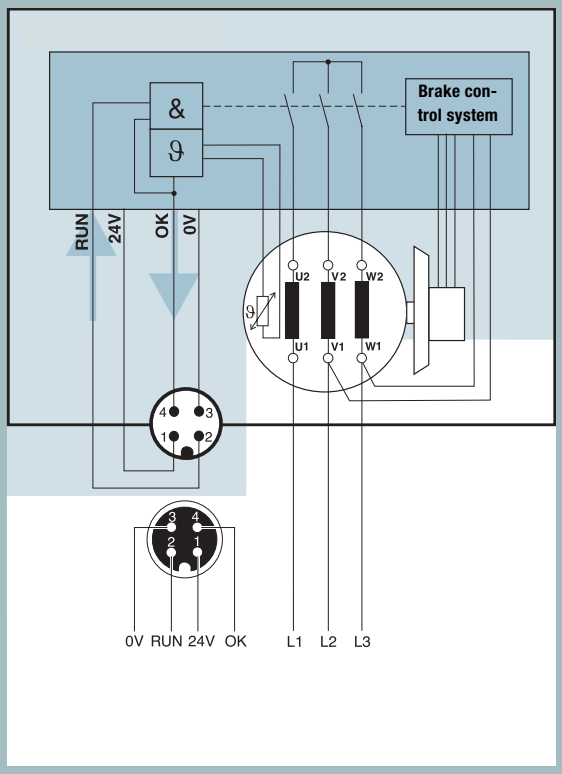
Type	MSW-1E	MSW-2S
Switching function	On/Off one direction of rotation	On/Off two directions of rotation
Switch element	Contactless star bridge switch	Switch element with contact
Direction of rotation	CW or CCW depending on phase sequence	CW **and** CCW, independent of phase sequence
Control via fieldbus communication	– Binary control signals RUN / OK – Connection via 1x M12-plug connector – Optionally with external AS-Interface	– Binary control signals CW / CCW / OK – Connection via 2x M12-plug connectors – Alternatively with integrated AS-Interface
Brake management	Standard with brake rectifier BGW	– Integrated brake control – Electrical manual brake release with optional BGM-rectifier
Supply voltage [V]	3 x 380 ... 500 V / 50/60 Hz	
Control supply voltage [V_{DC}]	24	
Brake voltage	Supply voltage, alternative supply voltage / $\sqrt{3}$	
Motor protection	Direct temperature monitoring with integrated analysis	
Degree of protection	IP54, as an option IP55, IP65, IP66	
Ambient temperature	-25 °C ... +40 °C (... +60 °C)	
Power range [kW] 4-pole 2-pole 6-pole 8-pole	 0.37 ... 3.0 0.55 ... 3.0 0.25 ... 1.5 0.15 ... 1.1	

Functional and Connection Principles

MOVI-SWITCH®-2S



MOVI-SWITCH®-1E



Wiring:

- SEW
- Customer

Detailed Solutions Make a Good Concept Even Better

System operators cannot make any compromises, especially when it comes to "small things." Fieldbus interfaces, field distributors and cable systems complete the SEW-EURODRIVE system solutions for each decentralization task.

We have thought about all details for quick, economical and flexible decentralization. Fieldbus interfaces, field distributors and cable systems complete the range of MOVIMOT® and MOVI-SWITCH® products.

The fieldbus interfaces support the communication with the most frequently used fieldbus systems, PROFIBUS, INTERBUS, CANopen, DEVICENet und AS-Interface. The fieldbus interfaces are based on a module terminal box with connecting terminals and a plug-in fieldbus module. These interfaces can be fitted directly onto MOVIMOT® or they can be mounted separately.

The variable speed MOVIMOT® drive is connected to the bus using terminals; additional sensors, actuators or MOVI-SWITCH® gearmotors without closed-loop control can be connected to the bus either by using terminals or M12 plug connectors. Fault diagnosis can easily be conducted via the bus in the event of a malfunction thanks to diagnostic interfaces and LED signals.

You can now organize the electrical connections in your production system even without a control cabinet

Field distributors rationalize the connection of drives with the power supply system, the 24 V_{DC} control voltage and the fieldbus. The units are based on the bus interfaces technology with additional connection technology for supply system distribution. Decentralized installation is made easy by installation of the field distributor close to the motor. The modular plug-in system makes for easy troubleshooting and maintenance, especially in case of a problem.

The hybrid cables have been developed in house and are combination cables which carry the power supply, control voltage and communication strands within one cable sheath. They also guarantee optimum EMC shielding and impedance.

The hybrid cable for connecting field distributors and MOVIMOT® is at the same time communication interface and supply voltage and control voltage connection in one cable. It is delivered as prefabricated cable with plug connector.

MOVIMOT® drives fitted with hybrid cables can be connected to the field distributor in a matter of seconds – ready to operate. For servicing, the plug can be disconnected without any danger, even by personnel without technical training. The drive can be replaced and the new drive reconnected quickly. The system is ideal for all applications requiring high levels of operating availability.

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Driving the world

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