

With which converter do you save from planning through to service?



SINAMICS G130: Converter chassis units with convincing advantages in every phase of the product lifecycle.

Answers for industry.

SIEMENS

SINAMICS – the optimum drive for each and every task

The drives family for drive solutions that are fit for the future

Low voltage							Direct current	Medium voltage		
AC							DC	AC		
For basic applications		For higher-value applications			For basic servo applications	For demanding applications		For basic applications and demanding applications	For applications with high power ratings	
SINAMICS G110	SINAMICS G110D	SINAMICS G120	SINAMICS G120D	SINAMICS G130/G150	SINAMICS S110	SINAMICS S120	SINAMICS S150	SINAMICS DCM	SINAMICS GM150/SM150/GL150/SL150	
V/f open-loop control	V/f open-loop control/FCC	V/f open-loop/vector control			Servo control	V/f open-loop/vector control/servo control		Closed-loop speed control/torque control	V/f open-loop/vector control	
0.12 – 3 kW	0.75 – 7.5 kW	0.37 – 250 kW	0.75 – 7.5 kW	75 – 1,500 kW	0.12 – 90 kW	0.12 – 4,500 kW	75 – 1,200 kW	6 kW – 30 MW	0.8 – 120 MW	
Pumps, fans, conveyor belts	Conveyor technology	Pumps, fans, conveyor belts, compressors, mixers, crushers, extruders			Single-axis positioning applications in machine and plant construction	Production machines (packaging machines, textile and printing machines, paper machines, plastics machines), machine tools, plants, process lines and rolling mills		Test stands, cross cutters, centrifuges	Rolling mill drives, wire-drawing machines, extruders and kneaders, cableways and lifts, test stand drives	Pumps, fans, compressors, mixers, extruders, crushers, rolling mills, mine winders, excavators, test stands
Common Engineering Tools										
Sizer – for simple planning and engineering					STARTER – for fast commissioning, optimization and diagnostics					

SINAMICS offers the optimum drive for each and every drive task – and all drives can be engineered, parameterized, commissioned and operated in the same standard fashion.

SINAMICS – can tackle any task

- Wide range of power ratings from 0.12 kW–120 MW
- Both in low-voltage and medium-voltage versions
- Standard, unified functionality by using a common hardware and software platform
- All drives are engineered in precisely the same way using just two tools: SIZER for engineering and STARTER for parameterizing and commissioning
- High degree of flexibility and the ability to be combined

SINAMICS G130 – maximum flexibility through a modular concept

With SINAMICS G130, machinery construction OEMs and plant construction companies can enjoy the benefits of a modular drive system that permits individual and application-related solutions for the design and integration into the electrical cabinet. This allows drive solutions that are perfectly tailored to the particular application to be implemented.

SINAMICS G130 comprises two modular, autonomous components:

- Power Module, and
- Control Unit

These two components can either be mounted separately or as single unit. Further, the drive system can be optimally adapted to the particular requirements as a result of many supplementary electrical components and options. Pre-defined interfaces simplify engineering and commissioning.

SINAMICS G130 – the cost-reducing chassis unit

For pumps, fans, compressors, extruders and mixer drives



Power and voltage ranges SINAMICS G130

380–480 V	110–560 kW
500–600 V	110–560 kW
660–690 V	75–800 kW

Quiet, compact, operator-friendly

SINAMICS® G130 is the Siemens chassis-format solution for high-rating single-motor drives without regenerative feedback into the line supply. These are predominantly applications that have square-law load torques, i.e. machines such as pumps, fans and compressors; but also constant-torque applications such as extruders, mixers or crushers can be addressed. A new technical concept makes these drive converter chassis units so unique. A modular mechanical design, extremely low loss IGBT semiconductors and an innovative cooling system. All of these features make SINAMICS G130 the quietest and most compact converter chassis unit. The ready-to-connect drive units are easy to operate, and service is simple thanks to their transparent, modular design.

Low costs: From planning to service

The SINAMICS G130 drive converter has been completely newly developed and distinguishes itself as a result of its cost-effectiveness and simplicity in every phase of the product lifecycle. This extends from planning and procurement through mounting & installation and commissioning up to day-to-day operation and service. SINAMICS G130 offers an excellent price-performance ratio and can be integrated in any automation solution.

100% line supply voltage at the motor – without any secondary effects

Up until now, voltage-source DC link converters used two main techniques to generate a variable output voltage. Each of these techniques has its own specific disadvantages: The so-called space vector technique minimizes the harmonic content in the motor current – and therefore the supplementary losses in the motor. However, only a maximum of 90% of the line supply voltage

is available at the motor terminals. As a consequence, it is possible that the rated operating point of the driven machine isn't reached – especially for machines with square-law load characteristics. The alternative technique using block pulsing can achieve an output voltage of up to 105% of the line supply voltage – but with an extremely high harmonic component in the motor. The result: Considerable harmonic losses in the motor and a significantly poorer utilization when compared to direct online operation. The SINAMICS G130 drive converter utilizes a technique that is absolutely unique in the marketplace. A technique that combines the advantages of the two techniques mentioned above. The so-called edge modulation with optimized pulse patterns means that the line supply voltage is available at the motor terminals at 100% load – and more specifically, without any secondary effects such as extremely high harmonics and supplementary losses in the motor. The converter losses are also lower. This so-called edge modulation is only available for Siemens drive converters such as the SINAMICS G130.



SINAMICS G130 – lower costs through simplicity itself



Integration into the plant: Fast and reliable

Plant construction companies and panel builders simply select the optimum version of the SINAMICS G130 – that can be used globally – from the easy-to-use catalog. The standard versions for all of the relevant voltage ranges and line frequencies are available within a short time. The power ratings are graduated according to user requirements and motor ratings so that the drives can be precisely dimensioned. The drive converters already have everything required so that they can be connected to grounded and non-grounded line supplies (TN, TT and IT line supplies). And SINAMICS G130 drives can be easily integrated into an automation solution through various analog and digital interfaces.

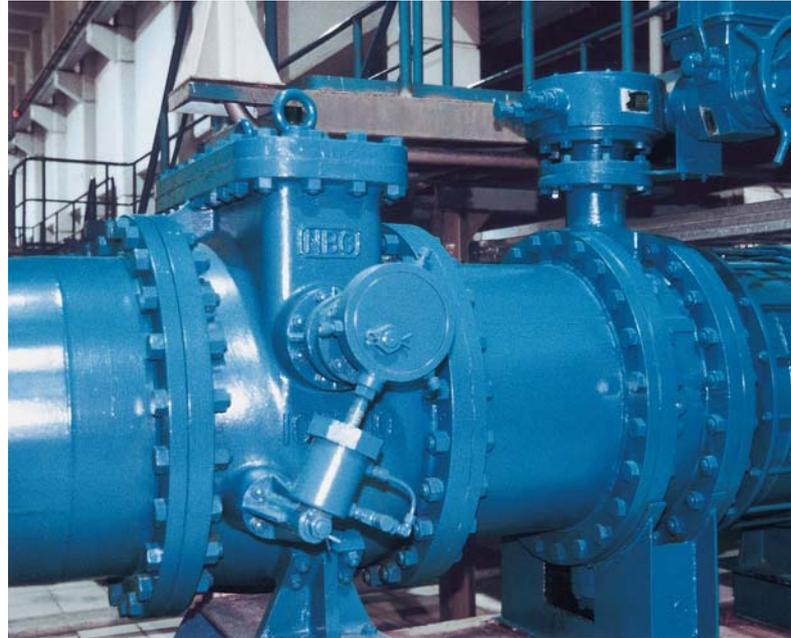
Fast commissioning and simple operation – without a Manual

A SINAMICS G130 is directly commissioned at the user-friendly AOP30 operator panel or – at the PC using the user-friendly STARTER commissioning software. In both of these cases commissioning is extremely simple and doesn't require any long training times. With the menu-prompted commissioning at the unit only a few parameters have to be set. As a whole, the time required for installation and operation has been reduced to approx. 1/10; further it is no longer necessary to study Manuals – a time consuming affair. And operation is just as simple as commissioning. The straightforward operation helps to avoid operator errors. This in turn increases the availability of the drive units and also the productivity of the plant as a whole.

Consequentially favorably-priced: SINAMICS G130

- Low costs from planning through to service
- Quiet and compact
- Cost-saving: The drive system requires up to 50 % less energy
- Precise: For flexible adaptation to the process
- Straightforward: Standard and simple operation
- Unique: 100 % line supply voltage at the motor without any secondary effects
- Also available as SINAMICS G150 cabinet unit

SINAMICS G130 – components and options



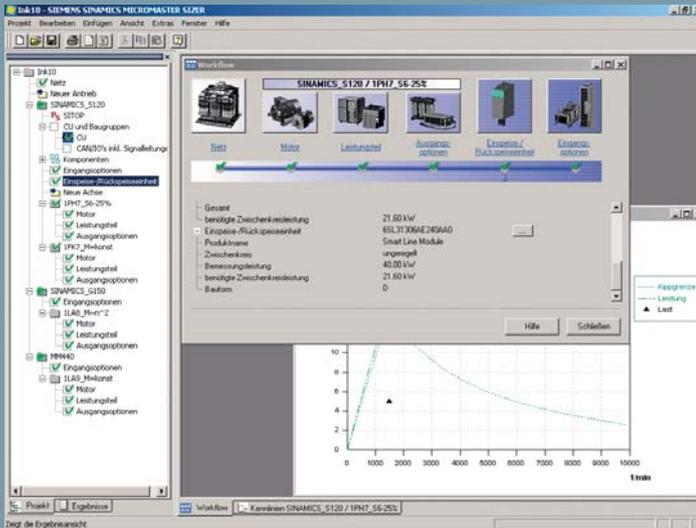
Flexible modular concept: Transparent and cost reducing

A wide range of options means that SINAMICS G130 drive converter chassis units can be precisely adapted to a customer's requirements. By being able to flexibly adapt the drive unit to the specific application avoids including functions that aren't required.

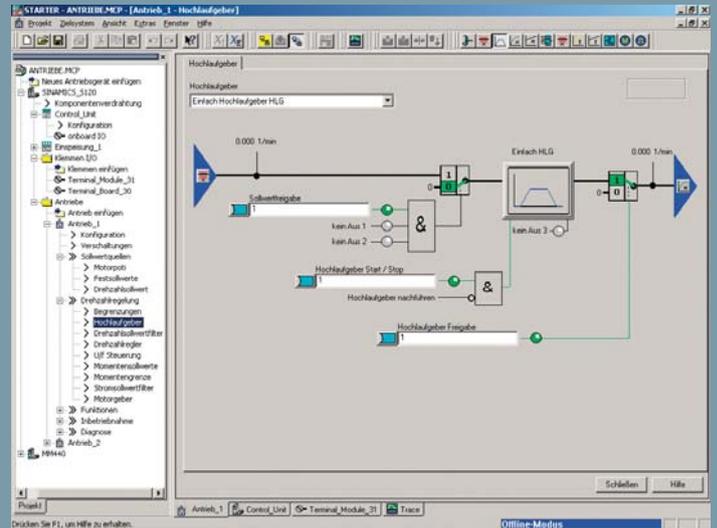
SINAMICS G130: Selection of options

- Main switch and main contactors including line fuses
- Circuit-breaker
- Line harmonics filter to limit harmonics to below the stringent limit values of IEEE519-1992
- Radio interference suppression filter
- Line reactors
- Braking unit
- Output reactors
- dv/dt filter to limit voltage gradients
- Sinusoidal filter
- Emergency Stop functions
- Thermal motor protection
- Connection for external auxiliaries

One system for all drives – standard engineering



SIZER tool



STARTER tool

Favorably-priced with system-based flexibility

As a consequence of its unique standard philosophy and operator control, the new SINAMICS drive family – that has been completely newly developed – has the potential to reduce costs! This means that it is easy to learn – and what has been learned can be directly applied to all of the other drives. For instance, with the higher-level standard tools for engineering, configuring and commissioning. The two SIZER and STARTER tools can run as autonomous Windows applications. Once the experience is gained with these tools, it can also be used when engineering any of the other SINAMICS drive products.

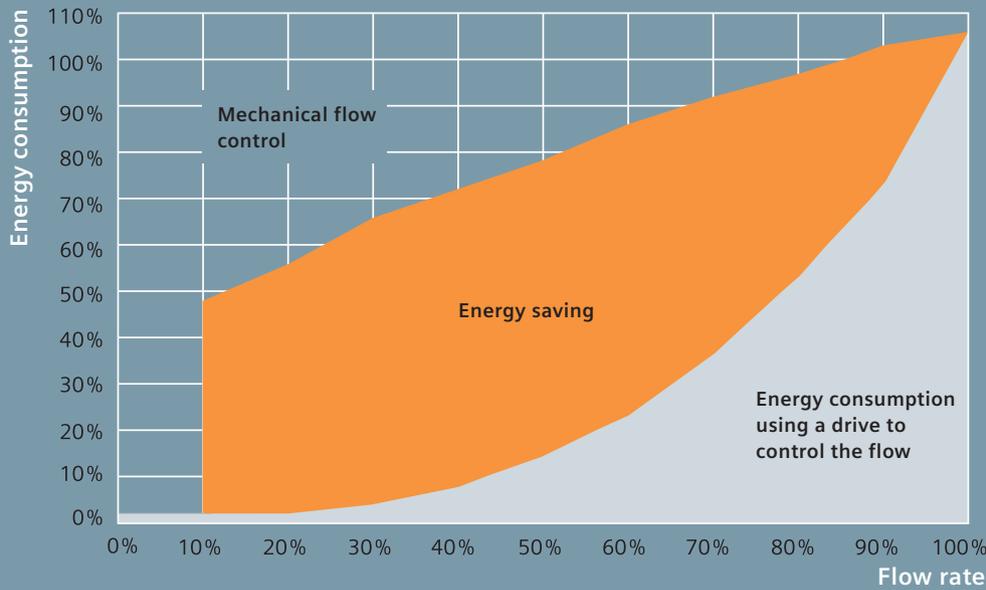
Minimizes time & costs: SIZER engineering tool

This engineering tool allows a drive system to be selected and dimensioned as quickly and reliably as never before. This is because it includes all of the SINAMICS components that are required to engineer a drive system – and as a result of the graphic operator interface, can be intuitively used. Using SIZER, every SINAMICS drive system can be quickly and simply dimensioned. SIZER means that the manufacturing costs of the plant or system are reduced as engineering simply takes less time.

Faster commissioning: STARTER tool

With STARTER you can reach your goal faster – without requiring any special system know-how. STARTER permits drive components to be simply configured and commissioned – menu-prompted and graphically. Data can be imported from the electronic type plates of the drive components, which significantly reduces parameterizing costs for users. It also reduces the time required and helps prevent incorrect data entries.

With variable speed – SINAMICS G130 saves energy



Saving instead of wasting: Variable-speed operation

Still today, pumps, fans and compressors are frequently controlled using traditional control techniques. These have a decisive disadvantage: The motor permanently operates at its rated speed with the maximum flow rate – although this is only infrequently required in practice. The result: Frequent partial load operation with high associated energy losses. This occurs for instance when throttles are used to control the flow. Variable-speed operation using a drive converter puts an end to this expensive energy wastage.

Saving in a double-digit percentage range

Converter-based variable-speed drive systems precisely adapt the power they draw to the actual requirements. This means that the motor only draws the power that is presently required. The power factor and efficiency remain almost constant. As a consequence energy savings of up to 50% can be achieved.

Optimizing the magnetic flux in the motor also provides additional energy saving. This is especially true for drives requiring low dynamic performance – such as pumps and fans – where the efficiency can be increased by an additional 10% in partial-load operation.

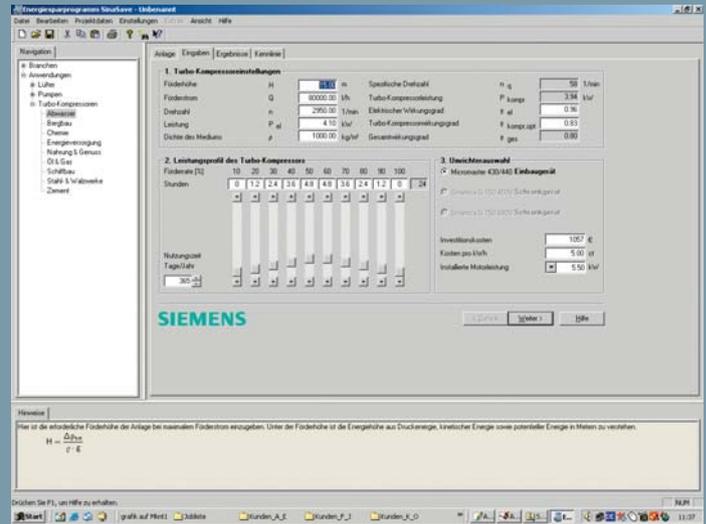
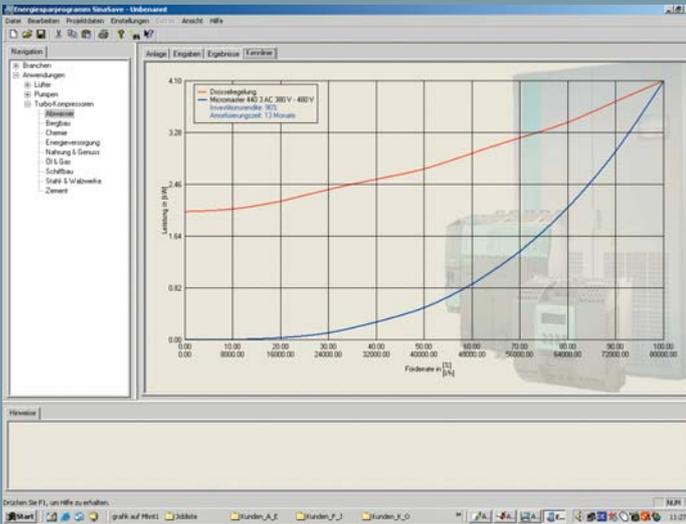
Reduces the stress on the plant and on the balance sheet

Drive converters avoid current peaks, torque surges as well as unfavorable operating states. Not only this, they also reduce the stress on the complete mechanical transmission line as a result of the soft starting and stopping. Mechanical controls are not required. The effect: Improved performance, lower maintenance costs and a longer lifetime. This reduces the level of stress on your plant as well as on your balance sheet.

Ideal for applications without energy recovery

With their rugged vector control SINAMICS G130 has been specifically designed for drive applications without energy recovery. A large proportion of these are machines such as pumps, fans and compressors – precisely those applications with the highest energy-saving potential.

An investment that pays off – SinaSave calculates the payback time



More on the subject of energy saving with SinaSave under: www.siemens.com/energysaving

Correct calculation using individual data

The SinaSave software tool quickly shows you the payback time for an investment made in an drive converter. The program calculates the energy saving based on the main specific plant and system parameters. The payback time is obtained from the monthly total saving and the purchase costs for the drive converter. This payback time is frequently just a few months.

A handle on all factors

The SinaSave energy-saving program takes into account all of the values required for the calculation:

- Flow rate and delivery head for pumps
- Mass flow and total differential pressure for fans
- Specific density of the medium being pumped

- Efficiency of the pump or compressor, electrical efficiency and total efficiency of the plant or system
- Number of working days and working shifts
- Pumping profile over the day and the year

The optimum technology at the right price

Based on the basic plant-specific data that was entered, SinaSave first defines the ideal drive system with the appropriate power rating and the price of a suitable drive converter. The program then calculates the energy demand of the variable-speed drive system for the specific application and compares this with values of all of the possible alternative concepts for the particular plant or system – that it also calculates (for instance, throttles, bypass, vane control or pole-changing motors). The energy

saving in Kilowatt hours is obtained from the difference. SinaSave then outputs the specific amount that can be saved based on the current price of energy. The costs for planning, engineering, integrating and commissioning can be added to the price of the drive converter. SinaSave then calculates the individual payback time taking into account the energy-saving and additional cost-reducing effects of variable-speed operation (e.g. improved power factor and operation that reduces the level of stress on the plant or system).

More on the subject of energy saving with SinaSave under: www.siemens.com/energysaving

SINAMICS G150 – the compact cabinet unit



SINAMICS G150 is the ready-to-connect drive converter accommodated in a standard electrical cabinet. These drives address the same types of applications as SINAMICS G130. This means high-rating single-motor drives without energy recovery – such as pumps, fans, compressors, extruders, mixers and crushers. With their standard design and standard dimensions these electrical cabinets can be seamlessly integrated into any plant or system. They have been optimized for low maintenance and have compact dimensions. Further, they can be simply and quickly installed and commissioned. These drive units can be adapted to the particular requirements using an extensive range of options. They are available with cabinet widths starting at 400 mm – increasing in 200 mm steps. They can be supplied in various degrees of protection up to IP54 without the mounting footprint changing.

There are two versions:

SINAMICS G150, Version A

Version A offers sufficient mounting space for all of the options that are available. There are different versions so that the line supply and motor can either be connected at the top or bottom. This results in a high degree of flexibility when it comes to mounting the units.

Service from Siemens: You can depend on it!



SINAMICS G150, Version C

This is an especially space-saving version for applications where the line supply connection components are accommodated in a central low-voltage distribution panel – which means that they don't have to be installed in the electrical cabinet. Both versions have the user-friendly AOP30 operator panel as standard mounted in the cabinet door.

SINAMICS G150 drives in standard electrical cabinets are available in the power range from 75 kW extending up to 1500 kW.

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