S·PowerDrive

Ultra-low harmonic, Compact & High efficiency Drives for High Power Process Applications

Nidec ACIM | LEROY-SOMER™

S-PowerDrive

SiC Technology Serving High Power Process Applications

The emergence of **silicon carbide (SiC)** follows the natural evolution of technologies developed over recent years in the automotive and aerospace sectors. These industries—pioneers in adopting high efficiency materials and components to meet growing requirements for performance, compactness, and energy efficiency—have paved the way for the large scale integration of SiC technology.
Today, SiC is not a disruption but the logical outcome of a long established shift toward lighter, more efficient, more reliable, and more energy saving systems.

Designed for **high power process applications, the S-PowerDrive** benefits from the advantages of SiC technology:

- **High efficiency and compactness**
- **Reduced losses and cooling demand across the entire system**
- **Optimized power architecture**, supporting high switching frequencies, reducing harmonics, improving current/torque dynamics, and offering enhanced compatibility with Wide Bandgap semiconductors (SiC, GaN) for advanced drive system performance.

The S-PowerDrive integrates optimized and robust SiC modules, delivering:

- ☑ Better energy efficiency
- ☑ Reduced CO_2 emissions
- ☑ High reliability for demanding environments (marine, oil & gas, energy, data centers, industrial processes)

Customized solutions:
Our engineering capabilities enable the development of power modules and systems tailored to customer projects.

Research and innovation:
Our R&D teams focus on integrating next generation SiC modules with ultra fast switching technologies to deliver greater performance, energy efficiency, and reliability. These advancements allow the creation of more compact, more powerful, and more sustainable systems.

Accelerating adoption:
Our solutions are designed to support industrial applications and renewable energy in the full utilization of SiC, a cutting-edge technology that delivers significant gains in energy efficiency, power density, and thermal performance.

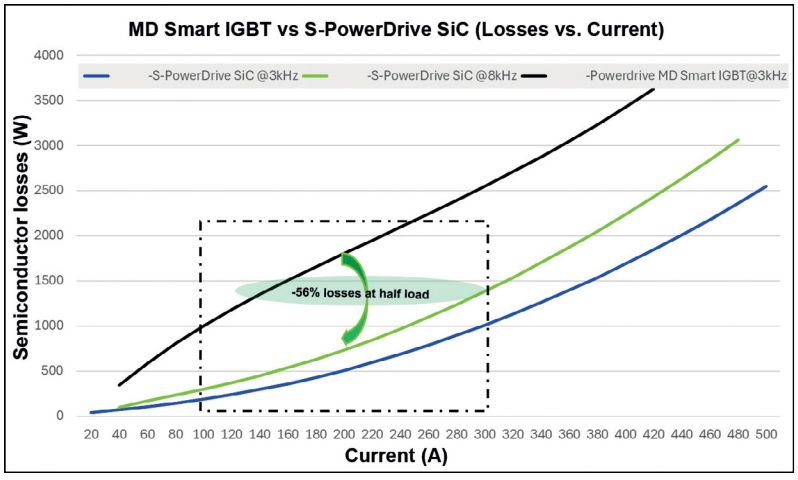
Innovation supporting Energy Efficiency

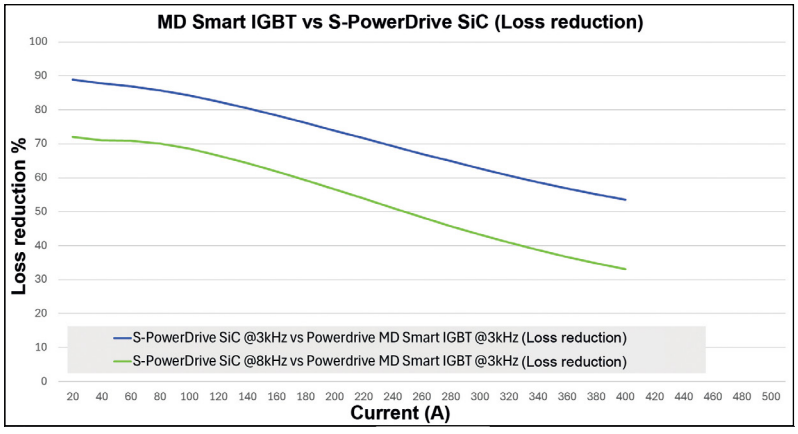
Cut Energy Costs with Sustainable, High Performance Solutions

Reducing energy costs is now a strategic challenge for industry. With rising energy prices and increasing environmental requirements, companies must find innovative ways to combine performance with sustainability.

Optimizing motorized systems using high-efficiency variable-speed technologies provides a concrete solution to today's energy efficiency challenges.
These solutions not only significantly reduce energy consumption, but also improve productivity, increase system reliability, and reduce the overall carbon footprint.
Investing in energy efficiency means investing in both competitiveness and sustainability.

The S-PowerDrive, combined with the Dyneo+ motor, forms a motor drive package with exceptional efficiency. It maintains optimal performance across the entire operating range, including at partial load. This unique combination delivers high performance, long term energy savings, and significantly exceeds the levels achieved by competitive market solutions.





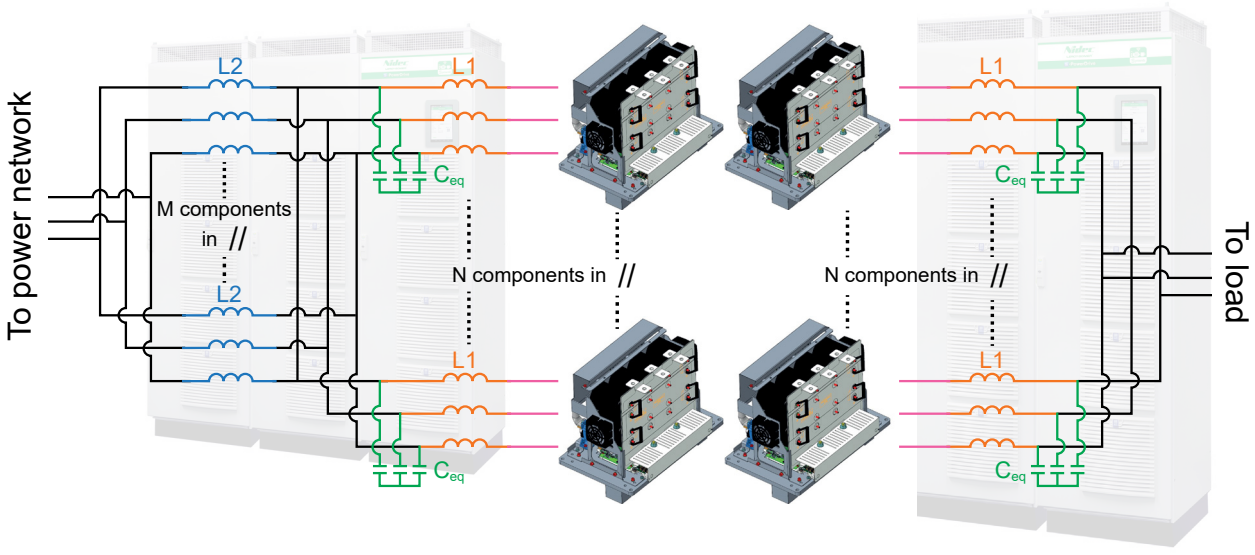
S-PowerDrive

High-Power in an Ultra Compact Format

Discover the **S-PowerDrive**, an ultra compact drive designed to optimize space without compromising performance or energy efficiency. Ideal for industrial environments where every centimeter matters, it combines innovation, reliability, and efficiency to meet productivity and sustainability challenges.

Thanks to its modular and compact design, the **S-PowerDrive** has a footprint 30% smaller than a standard variable speed drive and 60% lower losses, delivering exceptional energy efficiency while optimizing available space.
This innovative design ensures simplified integration and meets the demands of modern industrial environments where performance, reliability, and durability are essential.

30% smaller footprint compared to IGBT technology



60% loss reduction compared to IGBT technology

Zero Compromise: Harmonic Control at the Heart of Your Performance

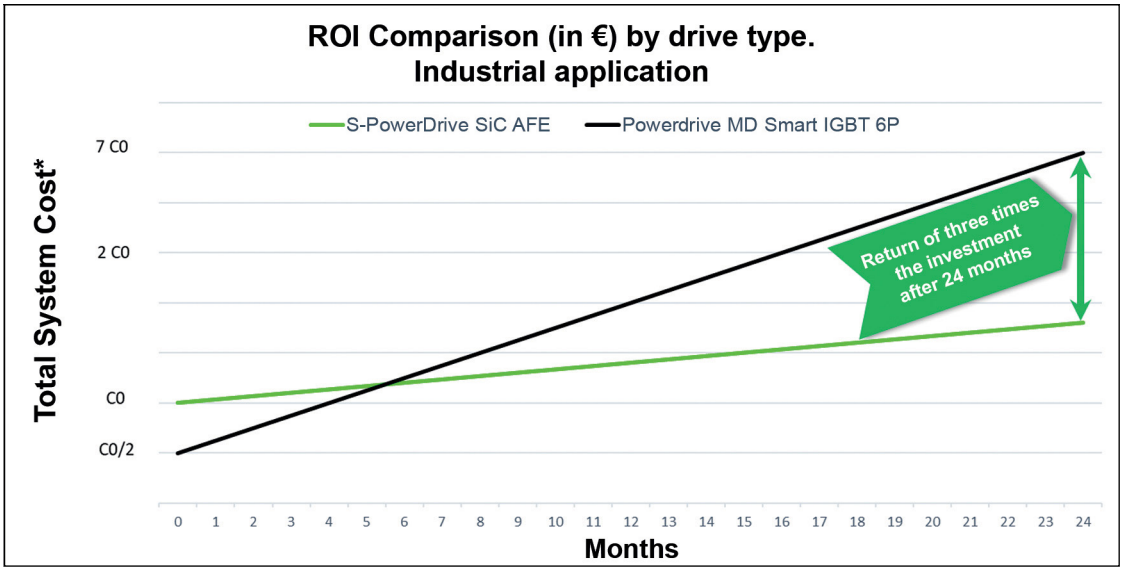
S-PowerDrive: A “clean” variable speed drive

Managing voltage and current harmonics has become a major challenge in industrial installations to prevent problems caused by their presence in the power grid.

Indded, harmonics generated by electronic equipment can induce nonlinear loads or distorted loads, cable voltage drops, and high transformer losses, leading to overheating and capacity limitations.

In its AFE (Active Front End) version, the **S-PowerDrive** ensures an extremely low harmonic level, reducing total distortion to below 5%, in compliance with IEEE 519 for industrial environments. The **S-PowerDrive** is a “clean” variable speed drive.

Thanks to its low harmonic performance, it allows downsizing of upstream transformers and power cables—optimizing infrastructure costs and ensuring a very fast ROI (Return On Investment).



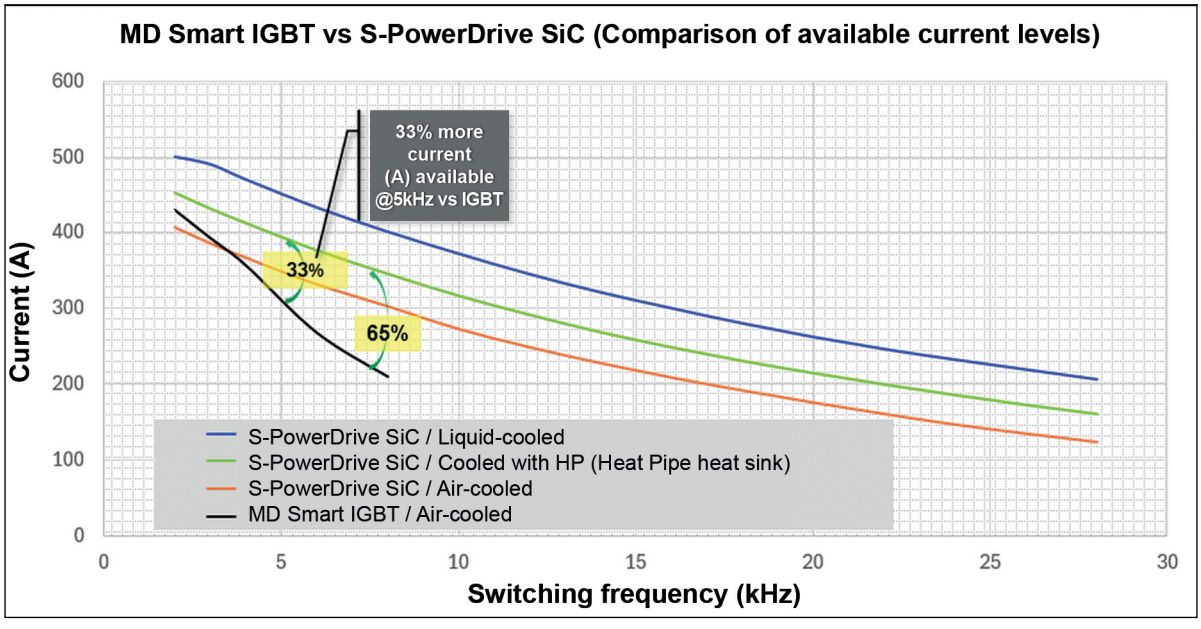
*Purchase Cost and Operating Cost

The above comparative curves between AFE SiC and IGBT 6 pulse technologies show a rapid ROI of just 10 months for the AFE SiC solution, resulting in a return of three times the investment after 24 months.

High-Frequency, High-Power: Minimal Derating

S-PowerDrive: Harness the potential of SiC to maximize power density while managing thermal constraints

The **S-PowerDrive** is designed to maximize performance, reduce losses, and ensure reliability, even at high switching frequencies*.



*Output frequency limited to 500 Hz (available upon request)

S-PowerDrive: Excellence Tailored to Your Applications

Oil & Gas – Reliability and Control in Extreme Environments

S-PowerDrive ensures operational continuity even under the harshest conditions. Its robust and compact design, reduced harmonics, and modular architecture guarantee stable motor control, minimize unplanned downtimes, and improve energy efficiency. The result: safer operations, controlled costs, and maximum uptime for critical facilities.

Marine – Certified Performance for Specific Environments

Marine certified, the **S-PowerDrive** delivers reliable performance under vibration, humidity, and temperature variations conditions. Its compact design simplifies integration on board, while its high performance control ensures more efficient propulsion and auxiliary systems. Shipowners benefit from reduced operating costs and greater reliability during all maneuvers.

Data Centers – Power Safety and High Availability

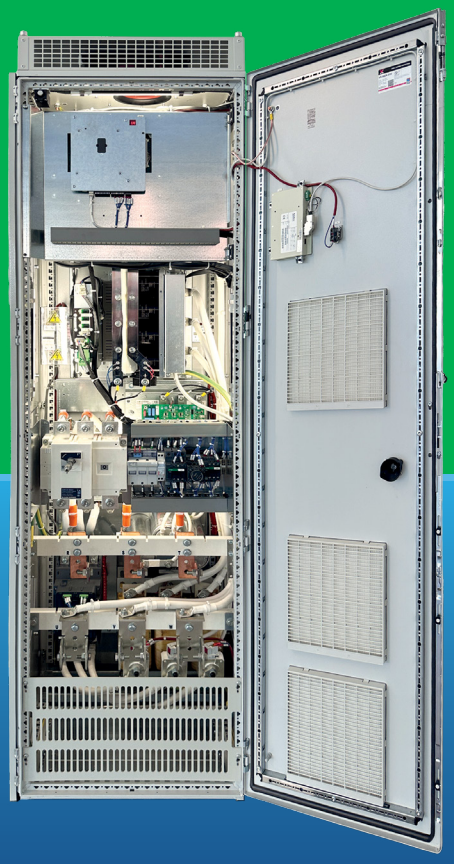
In data centers, the rule is simple: zero downtime. The **S-PowerDrive** ensures a stable power supply thanks to its modular architecture, its AFE technology with low harmonic distortion, and its ability to maintain optimal performance even in the event of electrical disturbances. It reduces the risk of failure, improves energy efficiency, and ensures the continuity of service that is essential for critical infrastructure.

High Speed Test Benches – High Frequency Motor Control

SiC technology enables a new era of high speed applications, offering higher power density and optimized dynamic performance.
Thanks to its SiC technology, the **S-PowerDrive** opens a new era for high-speed applications, offering increased power density and superior dynamic performance. Compact, intelligent, and built to last, the **S-PowerDrive** enables industries to achieve speed and efficiency levels that are unattainable with conventional solutions.

S·PowerDrive

Solutions tailored to the needs of OEMs



S-PowerDrive: Modular, High Performance, and Flexible Architecture for OEMs Engineering Needs

OEMs – Flexibility, Simplified Integration, and Added Value

With its modularity, wide power range, and Systemiz digital ecosystem, the **S-PowerDrive** integrates seamless into all OEM architectures. It offers fast commissioning, simplified maintenance, and advanced connectivity for monitoring and diagnostics. Manufacturers have access to a flexible, reliable, and premium solution that boosts the overall performance of their machines while reducing integration costs.

The **S-PowerDrive** is available as a complete, ready-to-use cabinet or as a rack-mount module, offering great flexibility for integration. Thanks to its modular architecture, the **S-PowerDrive** enables truly customized solution, perfectly tailored to the specific requirements of each application through a wide range of options and configurations. Our teams of experts support equipment manufacturers (OEMs) at every stage, providing the technical support necessary for simple, efficient, and reliable integration.

Easy to integrate and compact, it's an ideal solution for both new and existing installations, whether for machine builders (OEMs) or system integrators. Indoor and outdoor versions are also available to meet the needs of the most demanding environments.

The **S-PowerDrive** supports all major communication protocols, ensuring maximum compatibility and flexibility across all industrial architectures. Throughout the product lifecycle, our teams of experts are committed to assisting you with training, technical support, installation, maintenance, and more. We provide the level of support tailored to your needs.

S-PowerDrive

A Complete Offer

S-PowerDrive: Compact & High Efficiency

- ☑ IP21 or IP54 drive
- ☑ 6 pulse SiC or Active Front End (AFE) SiC versions
- ☑ Input 400 to 480 V or 525 V to 690 V

■ Standard installed options (wired, ready to use):

- Output filters
- Line switch
- EMC filter C2
- Heating resistor
- Emergency stop
- Automated fans
- Optional modules: fieldbus (Profibus DP V1, Modbus RTU, Ethernet TCP/IP, and CANopen), I/O expansion, encoder

A Complete Offer

Three phase 400 V to 480 V Power Supply – AFE Version

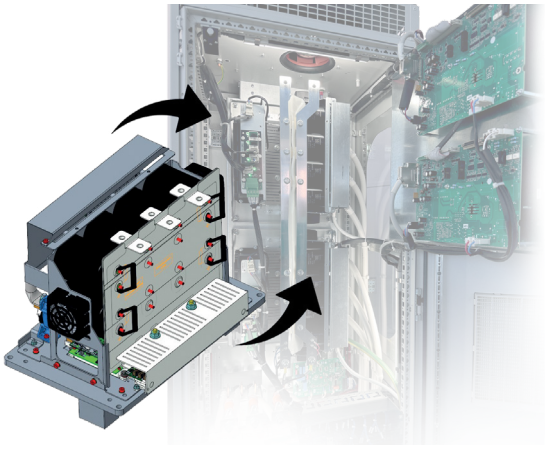
	Rated power						S-PowerDrive type	Dimensions (mm/in)		
	Normal duty			Heavy duty				H	W	D
	kW	hp	Ico (A)	kW	hp	Ico (A)				
Free-standing cabinet	132	200	260	110	150	204	MD3F2RA150TNS	2108 / 83	600 / 23.6	600 / 23.6
	160	250	315	132	200	248	MD3F2RA180TNS			
	200	300	408	160	250	321	MD3F2RA220TNS			
	250	400	497	200	300	391	MD3F2RA270TNS			
	315	450	618	250	400	486	MD3F2RA340TNS		800 / 31.5 or 1000 / 39.36	
	400	600	747	355	500	587	MD3F2RA430TNS			
	450	700	865	400	600	680	MD3F2RA470TNS			
	500	800	931	450	700	732	MD3F2RA570TNS			

Three phase 525 V to 690 V Power Supply – AFE Version

	Rated power						S-PowerDrive type	Dimensions (mm/in)		
	Normal duty			Heavy duty				H	W	D
	kW	hp	Ico (A)	kW	hp	Ico (A)				
Free-standing cabinet	132	200	150	110	150	120	MD3F2RA150THS	2108 / 83	600 / 23.6	600 / 23.6
	160	250	180	132	200	150	MD3F2RA180THS			
	200	300	260	160	250	204	MD3F2RA220THS			
	315	450	393	250	400	309	MD3F2RA340THS			
	400	600	478	355	500	376	MD3F2RA430THS			
	500	800	540	450	700	425	MD3F2RA570THS		800 / 31.5 or 1000 / 39.36	

■ Extended Standard Offer

- IP21/IP54 chassis in parallel up to 3000 kW / 4000 hp
- Liquid cooling from 132 to 3000 kW / 200 to 4000 hp
- AFE SiC or 6-pulse SiC technologies from 132 to 3000 kW / 200 to 4000 hp
- Wide range of options: data logger, braking chopper, auxiliary motor control, thermal relays…



6 pulse SiC	400 V	Air-cooled (MD3FxSAxxxTNS)
		Liquid-cooled (MD3FxSLxxxTNS)
	690 V	Air-cooled (MD3FxSAxxxTHS)
		Liquid-cooled (MD3FxSLxxxTHS)
AFE SiC (Active Front End)	400 V	Air-cooled (MD3FxRAxxxTNS)
		Liquid-cooled (MD3FxRLxxxTNS)
	690 V	Air-cooled (MD3FxRAxxxTHS)
		Liquid-cooled (MD3FxRLxxxTHS

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