



Giving energy more value

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تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج)

روبروی پالایشگاه نفت پارس، پلاک ۱۲



Europe

Italy
Spain

North America

U.S.A.

Central America

Panama

South America

Brazil
Chile
Colombia

Africa

South Africa

Asia

Singapore

50 Years

12+ GW

150+
Countries

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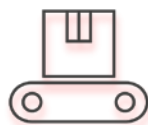
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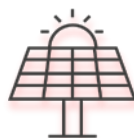
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Products and Services



Industrial Automation

For 50 years, Santerno has been defining, designing and manufacturing motor drives and soft starters for industrial applications in 25+ sectors



Photovoltaic

Santerno boasts 35-year leadership in power conversion systems producing solar energy, with 6 GW installed capacity



Energy Storage & Smart Grid

Santerno delivers best-in-class innovation technology offering reliable integrated solutions via tailor-made Smart Grid systems



Industrial Services

Santerno offers industrial services for solar plants as a Full EPC and offers comprehensive Operation & Maintenance service



Monitoring & Cloud

Santerno provides teams, technologies, big data analysis and 24/7 services ensuring comprehensive management of the Customer's plants via advanced cloud-based services

INDUSTRIAL AUTOMATION



Inverter
Soft Starters
AC/DC Converters
Solardrive Plus
Asynchronous motors
Remote Drive & Monitoring
Accessories

For over 50 years, Santerno has worked alongside our customers in the industrial automation field, offering the international market a complete range of electronic power converters.

Soft Starters, scalar inverters and vector inverters, drives for direct current and electric motors, are all part of Santerno's offer. We are professional provider of solutions with high performance and high energy efficiency.

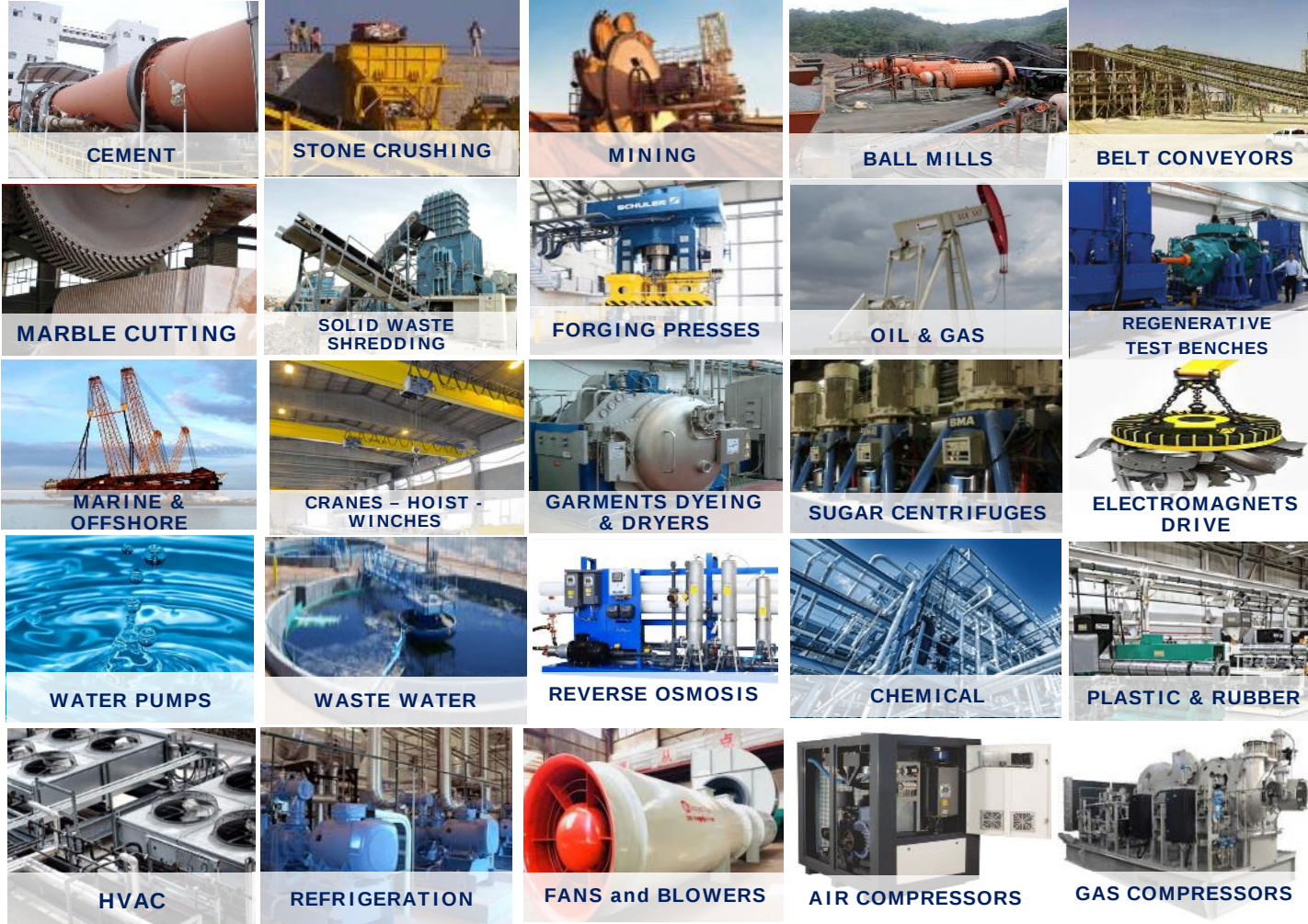
Drives and Soft Starters

15 product lines

>500.000 inverters sold worldwide

6,8 GW installed

General Purpose products – application specific solutions



80 applications
25+ industrial sectors

Our experts provide **pre-sales engineering support** for the proper selection and dimensioning of our products for the most demanding applications, and **after sales technical support** for commissioning start up



SINUS S

SINUS S

Introduction to an
innovative product line.



... are setting the benchmark for inverter drives because:



1) Modularity

Modular and scalable concept allows to select the inverter needed for the individual application.

2) Size

Extremely compact design and effective mounting for applications where space means money.

3) Usability

New, innovative interaction for commissioning, tuning & diagnostic of inverter both for simple stand-alone and demanding highly automated control systems.

Flexible Diagnostic

Keypad



USB module



WLAN module



Modularity

Control Unit

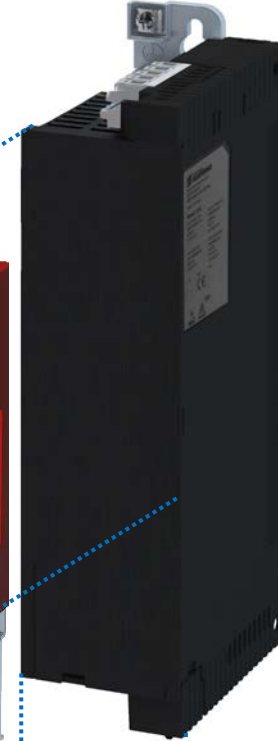
Diagnostic module



STO Safety module



Power Unit



SINUS S
highest flexibility :
you define your inverter
selecting the single
components



Inverter
Performance

Cranes

Winders

Extruders

Conveyors

Automatic Machines

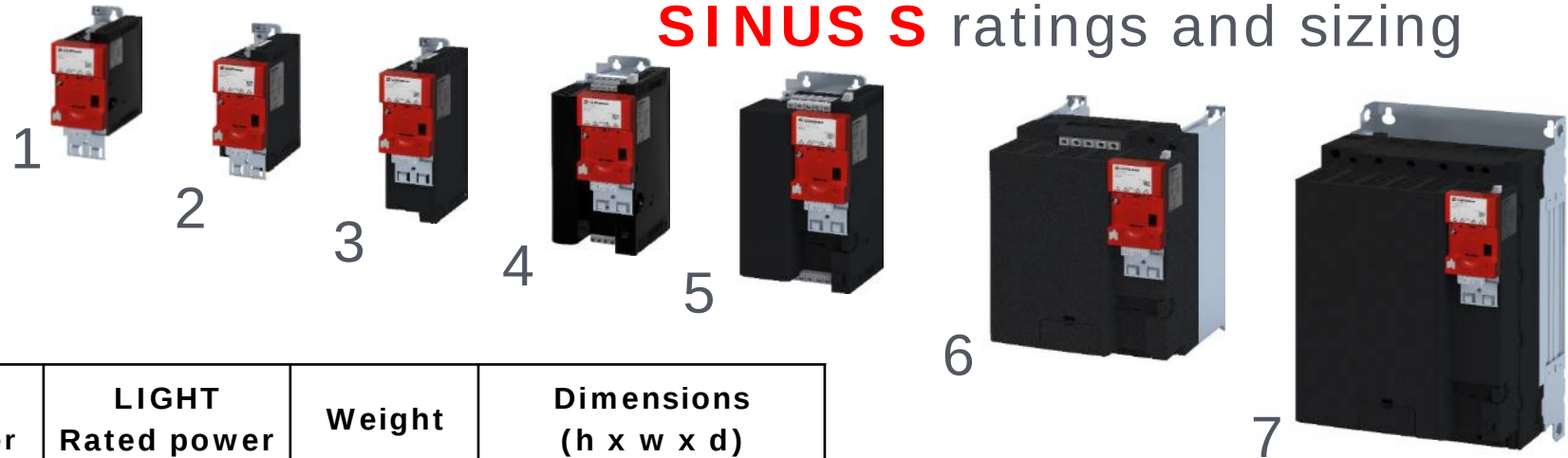
Roller or belt conveyors

Pumps / Fans

Requirements

Excellence in
Speed and Torque
control for most
demanding
applications !

Key Features		
Design & Delivery	Modular design (complete inverter or components)	
Power Range	0.37 - 30 kW (Heavy Duty) 4.0 - 37 kW (Light Duty)	
Hardware	• Memory module • IT-Grid compatible • Integrated EMC filters • Zero clearance mounting • Programmable form „C“ relay • Brake chopper • DC bus sharing • STO (optional) • Dedicated PTC	
I / O Communication Spring loaded control terminals (fixed)	Standard-I / O • Pluggable control terminal • Bipolar speed reference • 24 V keep alive • Selectable PNP or NPN logic	Application-I / O (optional) • Additional I/Os
Fieldbus	CANopen, Modbus RTU, Profibus, EtherCAT, Profinet, Ethernet-I/P, Modbus TCP (optionals)	
Diagnostics	Hot-swappable options: Keypad, USB module, WLAN module, Remote keypad	
Motor Control	• V / f (VFC linear, square & eco) • Sensorless Vector Control (SLVC) • SLPSM • Servo Control closed loop SC (ASM only with 100 kHz HTL)	



SINUS S Model	HEAVY Rated power	LIGHT Rated power	Weight	Dimensions (h x w x d)
	[kW]	[kW]	[kg]	[mm]
SINUS S 0001 4T BA2K2	0,37		0,8	155 x 60 x 130
SINUS S 0002 4T BA2K2	0,75		1	180 x 60 x 130
SINUS S 0003 4T BA2K2	1,5		1,35	250 x 60 x 130
SINUS S 0005 4T BA2K2	2,2		1,35	250 x 60 x 130
SINUS S 0006 4T BA2K2	3	4	1,35	250 x 60 x 130
SINUS S 0007 4T BA2K2	4	5,5	1,35	250 x 60 x 130
SINUS S 0011 4T BA2K2	5,5	7,5	2,3	250 x 90 x 130
SINUS S 0014 4T BA2K2	7,5	11	3,7	276 x 120 x 130
SINUS S 0017 4T BA2K2	11	15	3,7	276 x 120 x 130
SINUS S 0020 4T BA2K2	15	18,5	10,3	347 x 204.5 x 222
SINUS S 0025 4T BA2K2	18,5	22	10,3	347 x 204.5 x 222
SINUS S 0030 4T BA2K2	22	30	10,3	347 x 204.5 x 222
SINUS S 0034 4T BA2K2	30	37	17,2	450 x 250 x 230

SINUS S :

13 models

7 sizes

Optimized to pack
more power in less
space



SINUS S Model	Mains supply	Heavy Duty			Light Duty		
		Rated power	Rated output current	Overload current (60 s)	Rated power	Rated output current	Overload current (60 s)
		[kW]	[A]	[A]	[kW]	[A]	[A]
SINUS S 0001 4T BA2K2	AC 3 phase 380-480 Vac -15%/+10% 45 Hz ... 65 Hz Common DC BUS 450 Vdc -0% ... 750 Vdc +0%	0,37	1,3	2	0,37	1,3	2
SINUS S 0002 4T BA2K2		0,75	2,4	3,6	0,75	2,4	3,6
SINUS S 0003 4T BA2K2		1,5	3,9	5,9	1,5	3,9	5,9
SINUS S 0005 4T BA2K2		2,2	5,6	8,4	2,2	5,6	8,4
SINUS S 0006 4T BA2K2		3	7,3	11	4	8,8	11
SINUS S 0007 4T BA2K2		4	9,5	14,3	5,5	11,9	14,3
SINUS S 0011 4T BA2K2		5,5	13	19,5	7,5	15,6	19,5
SINUS S 0014 4T BA2K2		7,5	16,5	25	11	23	23,6
SINUS S 0017 4T BA2K2		11	23,5	35	15	28,2	35
SINUS S 0020 4T BA2K2		15	32	48	18,5	38,4	48
SINUS S 0025 4T BA2K2		18,5	40	60	22	48	60
SINUS S 0030 4T BA2K2		22	47	71	30	56,4	71
SINUS S 0034 4T BA2K2		30	61	92	37	73,2	92

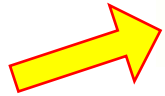
SINUS S further technical data

Worldwide product due to :

- Norm conformity
- Voltage range
AC 340 V...538 V, 45 hz ...65 Hz

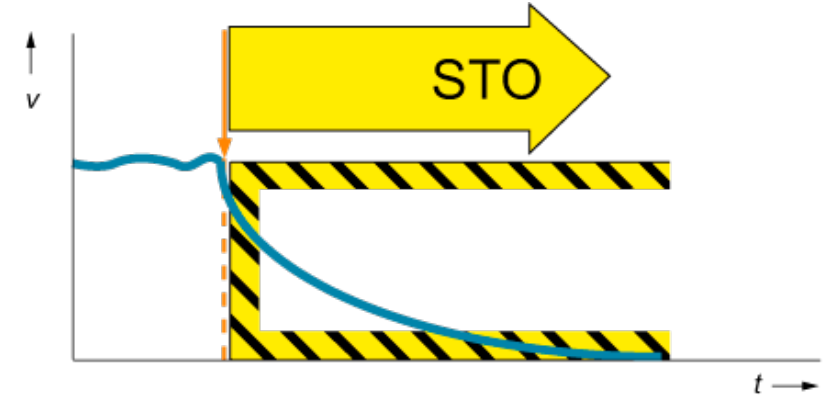
Degree of protection	IP 20, coated PCBs
Mounting	Zero clearance side by side upright mounting, without de-rating
Norm conformity	CE, EAC, RoHS2, cUL
Efficiency Class	IE2 according to EN 50598-2
Main frequency	45 Hz..65 Hz +/- 0%
Overload Capability	HEAVY DUTY 200% rated current for 3 s 150% rated current for 60 s LIGHT DUTY 120% rated current for 3 s
Switching frequency	2,4,8,16 kHz
Output Frequency	599 Hz
Max. motor cable lengths	C2 < 20 m
Temperature	-10 °C – 55 °C (>45 °C reduce rated output current by 2.5%/°C)
MTBF	600'000 h





New innovative design

- Extremely small in size
- Modular design: Only select when needed while remaining in same product family
- Easy to add after installation if requirement changes



STO options: „Safe Torque Off“

- Performance Level PL e¹⁾
- Safety Class SIL 3²⁾

1) ISO 13849-1

2) EN 62061 / EN 61800-5-2

The integration of the STO module permits:

- To reduce installation costs
- To reduce the usage of cabinet space
- To reduce the deterioration

RCD Operation:
30 mA FI < 2.2 kW

IT-Grid operation
Through removal of IT-
Screws

Integrated EMC Filter
C1 < 3 m
C2 < 20 m⁽¹⁾
1) EN61800-3

Our summary:

One EMC friendly inverter
for various needs.

Shield plate control
I/O cables

Motor Cable shielding either on
Cabinet or shield plate
(optional)
supported



		Label	Standard I/O	Application I/O
I/O	Digital Input	DIx	5	7
	Digital Output	DOx	1	2
	Ground	GND	3	5
	Analog Input	AIx	2 (Bipolar V/I)	
	Analog Output	AOx	1 (V/I)	2 (V/I)
	10 V Supply	10V	1	
	24 V Internal	24V	1	2
	24 V External	24E	2	
	Encoder HTL 100 kHz	DI 3 / 4	Yes	
	PTC	T1/T2	1	
	Relay	NO/NC/COM	1 (NO/NC)	
	Time		1 msec	
	Logic		PNP o NPN	



Standard-I/O

Scalable I/O
to match
machine
requirements



SANTERNO motion control world



Highest flexibility
for customers



Keypad



USB module



WLAN module



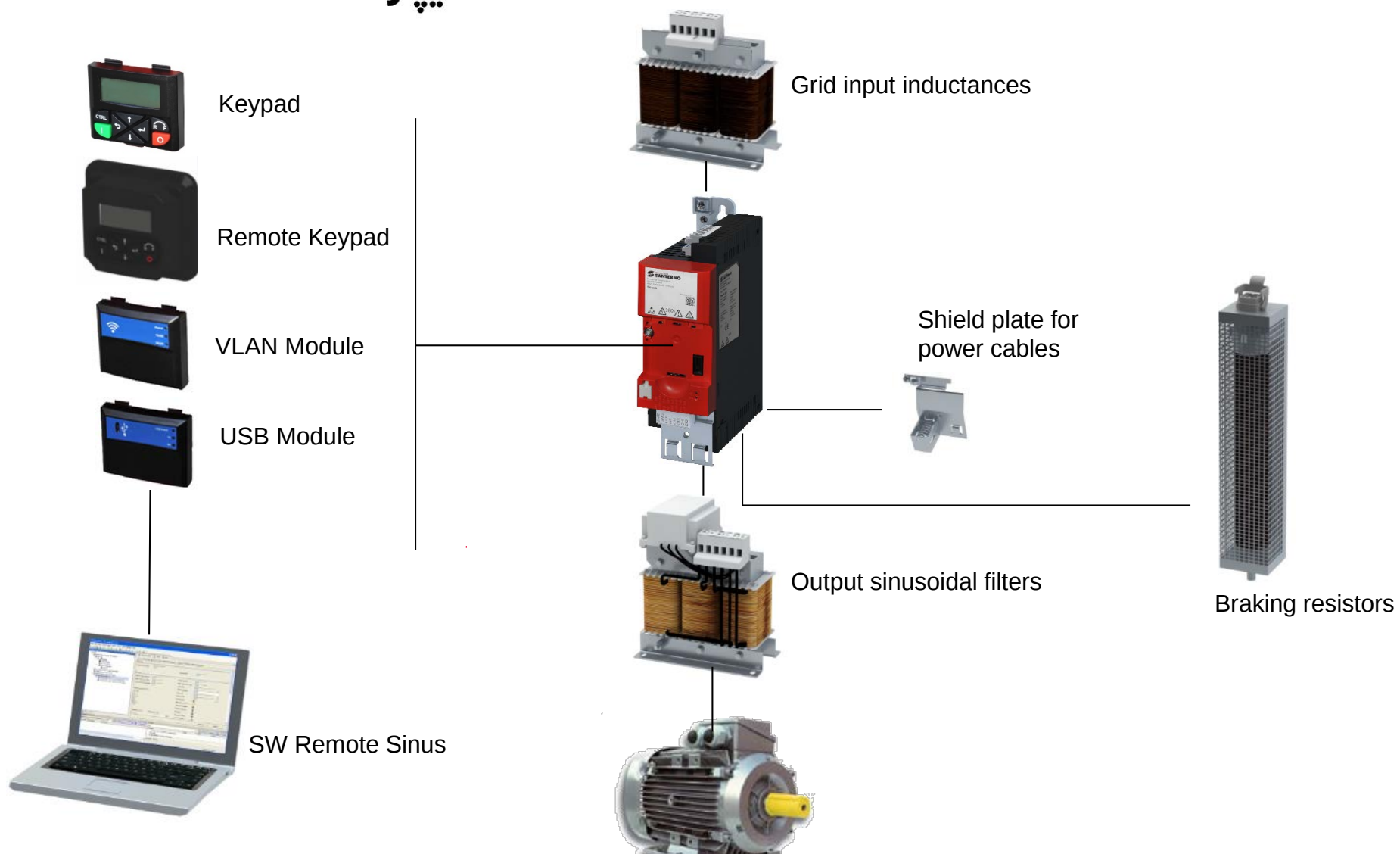
Features

- **Modularity:** Select the diagnostic module that fits best to you – or none!
- **Hot-Swappable:** Change the diagnostic module during operation without any operational disruption.

Customer Benefits

- Conscious decision of what is really required.
- One diagnostic module for multiple inverters in one machine is sufficient.

Modular & hot-swappable diagnostic module help customers reduce cost.



Features

Motor Control Mode

Speed or torque control

V / f (linear, quadratic) (VFC plus)

VFC ECO

Sensorless Vector Control (SLVC)

Servo Control closed loop (SC)

Asynchronous & Permanent Magnet Motors

Multi Motor Parameter Sets
(switch sets with DI or Network)

Main application functions

Freely assignable user menu

S-shaped ramps for smooth operation

PID controller

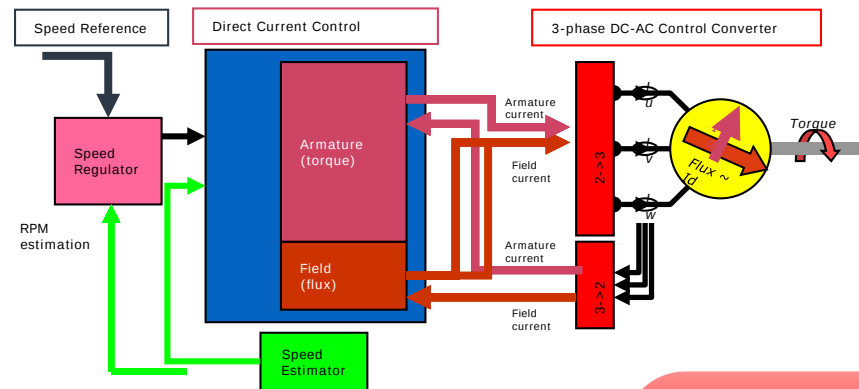
Sequencer

Sleep / rinse function

OEM parameter set

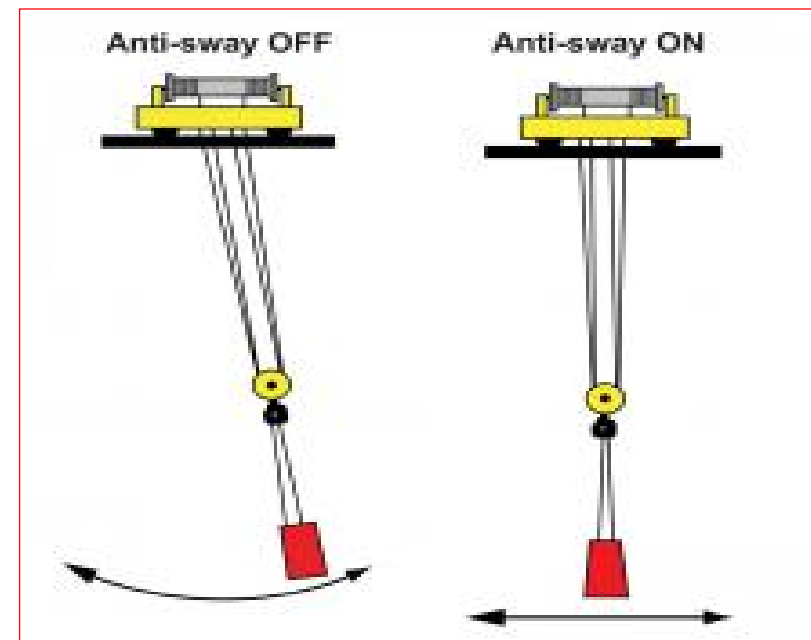
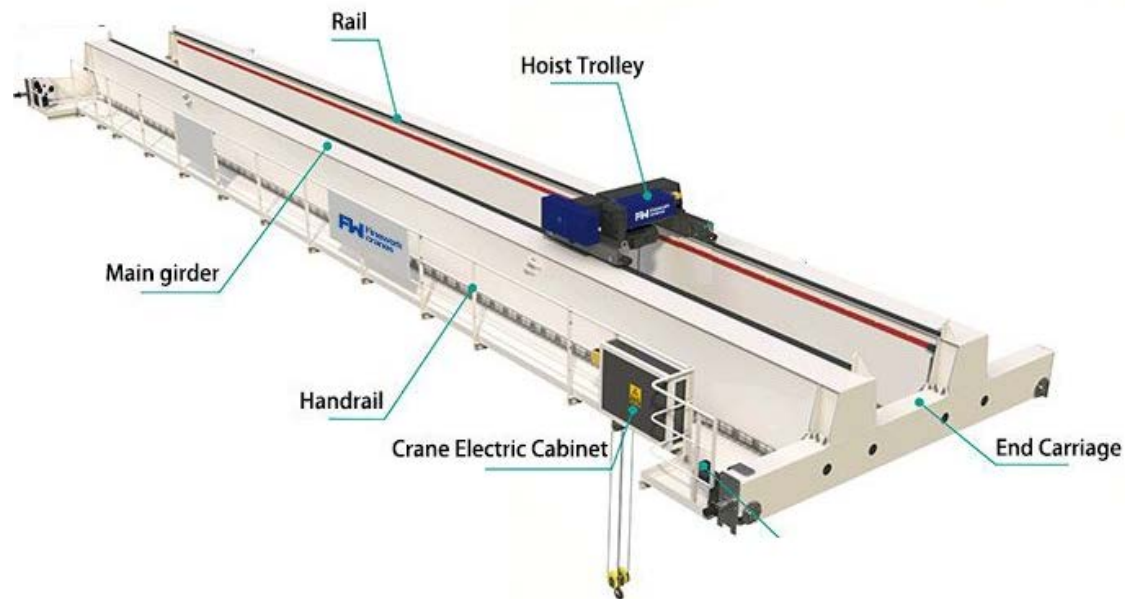
DC Brake

Dynamic Brake / DC bus access



Scaled capabilities that deliver customer solutions

Antisway functions for trolley and gantry



Integrated and easy
antisway function for
translation operations

Parameters Group (Keypad, Remote Sinus)	content
Group 0: Preferred	Preferred parameters by the user
Group 1: Diagnostic	All diagnostic
Group 2: Basic Setup	Acceleration , decel jog, etc.
Group 3: Motor control Setup	Motor control parameters
Group 4: I/O Setup	I/O functionalities parameters
Group 5: Fieldbus Setup	Field bus parameters
Group 6: PID Setup	Internal PID when the inverter is used as a controller (i.e. for pumps/fans)
Group 7: Advanced Setup	Parking brake setup, Dinamic braking
Group 8: Setup sequence	Process setup sequence

Easy Interaction !

User interfaces



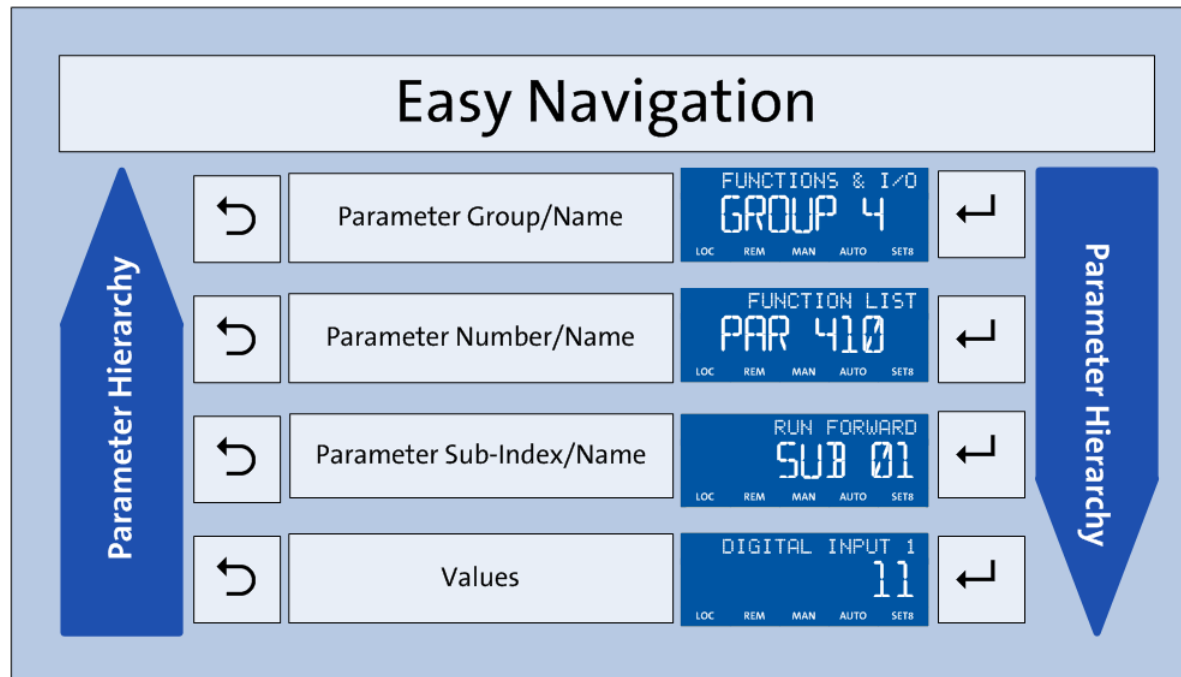
				
	Without diagnostic module	Keypad	WLAN module and PC connection	USB module and PC connection
Operation	✓ ☐			
Basic parametrization		✓ ☐		
Advanced parametrization			✓ ☐	✓ ☐
Commissioning via field busses	✓ ☐			
On site diagnostic		✓ ☐		
Advanced diagnostic			✓ ☐	✓ ☐
Diagnostic via field busses	✓ ☐			

Flexibility to access parameters depending on specific hardware configuration



Example At a glance :

- Group 2 parameters
- Basic setup
- Parameter 20
- Acceleration time 1



Intuitive design
to facilitate the
user

Convenient connection, easy usage with

- Remote Sinus PC Tool



Connection via
WiFi and/or
WLAN

Remote Sinus
PC tool

USB module

Standard USB 2.0
Power Supply via PC



No external power supply required for interaction with inverter!

- Easy parameterization of inverter or programming automation system in the office.
- Easy serial commissioning

Evolving Easiness with Remote SINUS



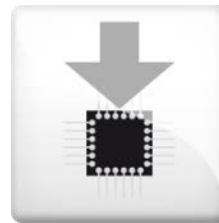
Setting parameters online (Remote Sinus)

For easy online diagnostics, parameterization and commissioning – New dialogues for SINUS **S**



Upload an application (Remote Sinus)

To load complete applications into the SINUS **S**



Loading firmware (Remote Sinus)

For updating the firmware



WEB based IOT for SINUS PENTA

Since 2007, We have more than **12000** inverters connected in real-time to our cloud platform **santerno.io**

Thanks to our proprietary dataloggers, mounted inside or besides our inverters we are able to acquire the relevant measure from the inverter and from all sensors connected to it.

We allow the clients to provide added value monitoring and maintenance services to the end customer.

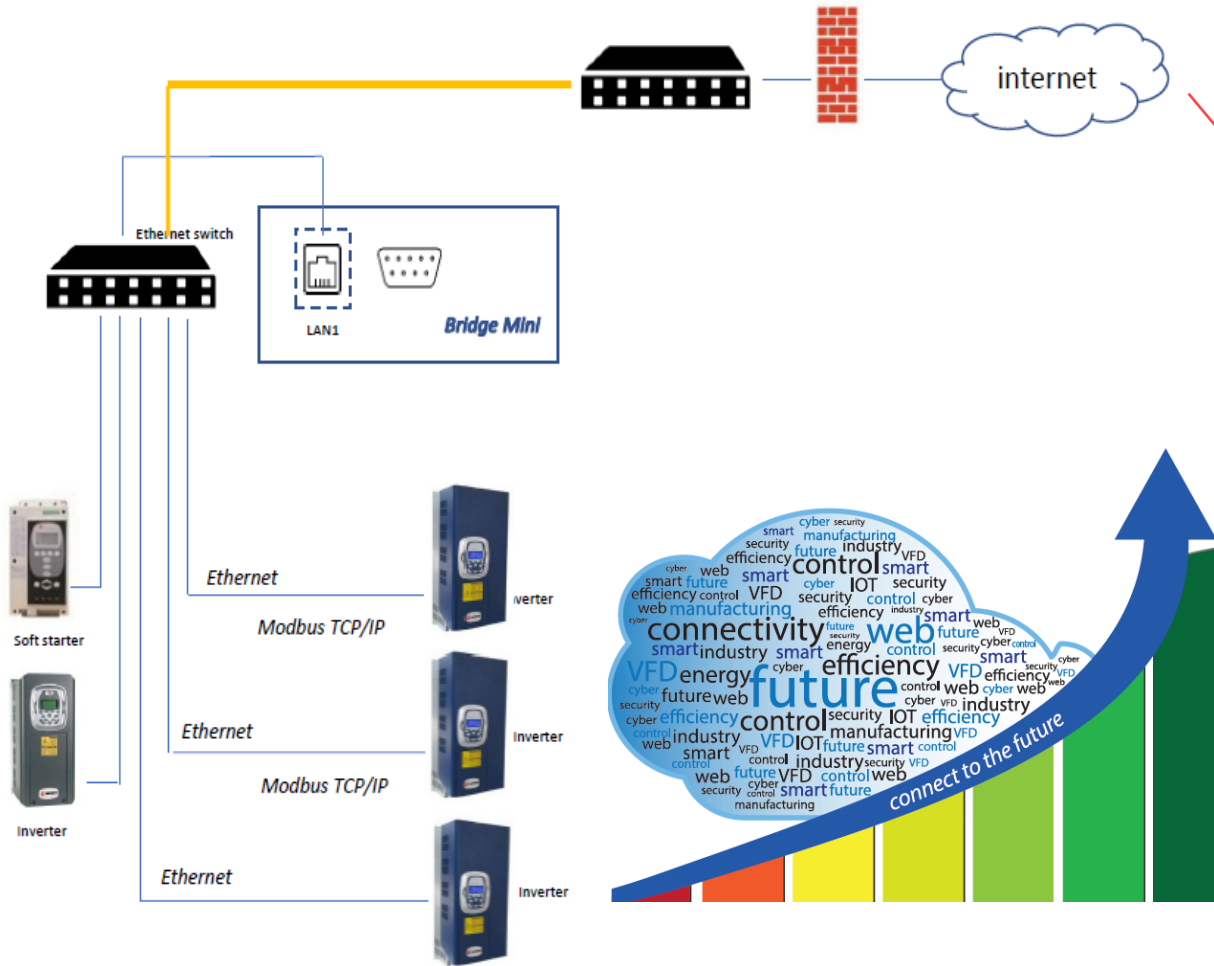


Bridge Mini

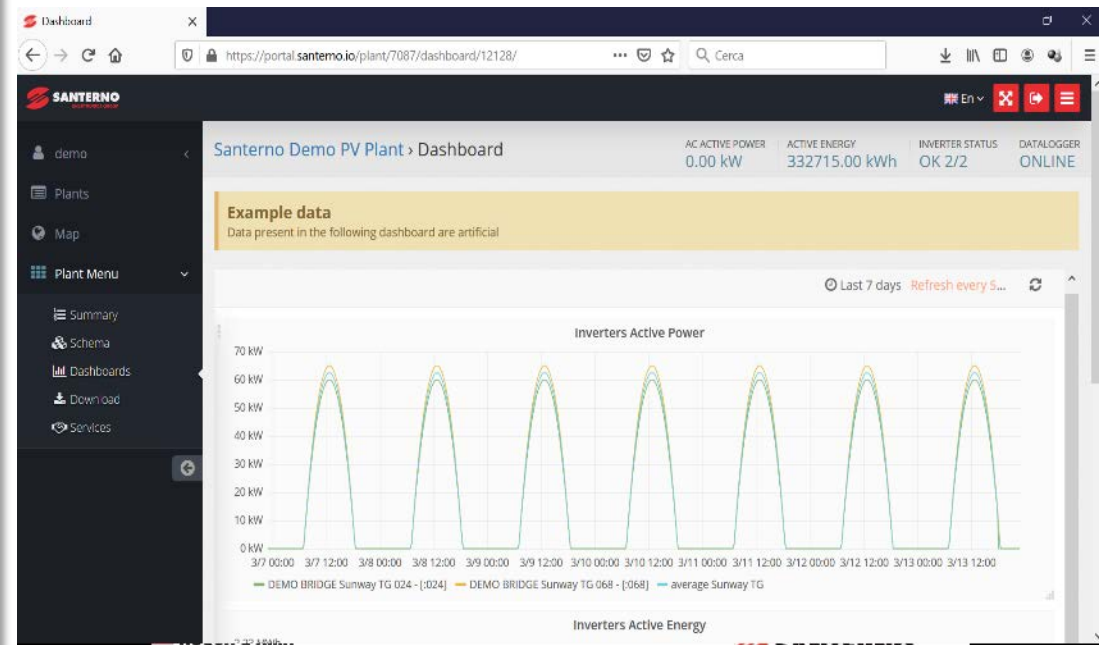
Stand alone external version,
mountable on DIN rail.

Local datalogger for remote control and monitoring

- **Bridge Mini** : stand alone device, can be mounted on a standard DIN rail and control up to 63 VSD and Soft Starters.



Santerno.io



SINUS S inverters Drives



Giving energy more value

