POSIDYN® SDS 5000

**SERVO POWER
AND MORE**

STÖBER

POSIDYN® SDS 5000

Servo inverters with all-round rationalization potential

Motion Control

The POSIDYN® SDS 5000 servo inverter offers maximum torque, speed and position control performance. It is designed for challenging servo technology tasks, based on the latest technology.

As a member of STOBER's 5th inverter generation, this powerful and innovative servo inverter can utilise all the potential of the new STOBER software suite V5.

With a new secure remote service concept, STÖBER ANTRIEBSTECHNIK puts the spotlight on a sensitive subject previously given little consideration.

WITH SECURE REMOTE MAINTENANCE

Preliminary remarks:
Remote service is increasingly in demand and in use due to its tremendous cost saving potential.

But it is clear that its safety aspects are rarely considered. Lack of organisational and legal clarity can result in unintended or unauthorised changes having to be accepted in an emergency with all the consequences.
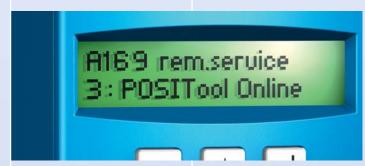
>> Defining and safeguarding responsibility is therefore a fundamental component of the STOBER remote service concept.

STOBER remote service concept

The STOBER remote service concept requires the participants to adopt a regulated approach. The remote service professional can be sure that he is communicating with a responsible person on the spot who is in charge of.

All the operations and processes forming part of local servicing can be carried out via the STOBER remote service.

Remote service includes any indirect link between a PC (with comissioning software POSITool) and a POSIDYN® SDS 5000 servo inverter or IGB network. The link can be made through the Internet or a local network.

System integrated control of responsibility

A responsible employee of the operator or machine manufacturer activates the remote service request locally as required. This is done directly via the POSIDYN® SDS 5000 servo inverter or the PLC.
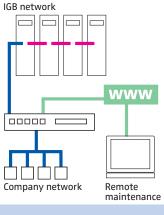He also contacts the service technician concerned.

This ensures that the responsible person is present locally at the machine to check the facts and personnel safety.

If the remote service request goes via the Internet, an outgoing connection is made, so that the system administrators do not have to isolate specific ports. A safety gap is not left in the operator's system.

The service technician logs onto the relevant servo inverter with POSITool via this Internet access.

IGB network

WWW

Company network   Remote maintenance

INTEGRATED BUS (IGB)

Integrated bus for performance, convenience and safety

The self-configuring integrated bus (IGB) is a standard feature on the new POSIDYN® SDS 5000 servo inverter.

This technology enables a wide variety of communication and functional concepts between a number of servo inverters and interfaces to be real-time controlled.

When the IGB motion bus is used, every POSIDYN® SDS 5000 in the IGB network transmits data cyclically and can at the same time access the other data in the network.

A field bus (PROFIBUS, PROFINET, EtherCAT®, CANopen®) is ideally used for communication with a higher-level control system.

Two RJ45 connectors (X3) are located on the front of the housing for different potential uses of the IGB:

- IGB motion bus:
  Multiaxis synchronisation between servo inverters
- Direct access from PC to servo inverter
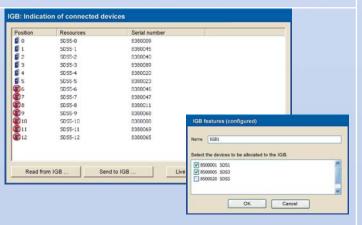- Internet access for remote service

User friendly with the IGB motion bus

The IGB motion bus function is activated via the comissioning software POSITool configuration assistant.
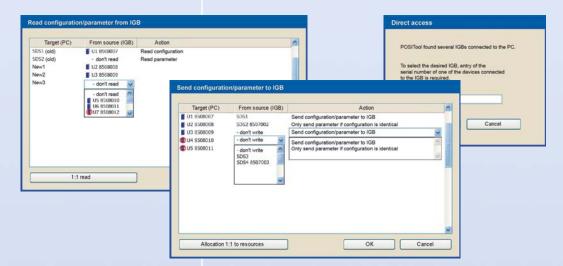
Leading axis positions for synchronous running or electronic cam applications (for example) can be exchanged through the IGB motion bus.

Every POSIDYN® SDS 5000 servo inverter can transmit and read up to six different parameters (max. of 26 bytes of data) on the IGB motion bus. These parameters can come from different SDS 5000 series models.

IGB network

To configure an IGB network with several servo inverters in the POSI-DYN® SDS 5000 series requires only a cable connection on the front of the housing. When the inverters are switched on, the network configuration is automatic.

Additional inverters in the series can be integrated in the IGB network by hook-up.

Up to 32 axes can be operated in the IGB network. Every servo inverter in the network can be accessed for the diagnosis of the IGB network.

MULTIPLE USE BY AXIS CHANGEOVER SWITCH

Multiple use by alternate control of different servo drives

Servo drives often go into action at timed intervals. Typical examples of this are handling operations and format adjustments. Multimotor operation with only one POSIDYN® SDS 5000 servo inverter is suitable for these applications.

Axis changeover switch

The POSISwitch® AX 5000 external module has been developed for connection of the digitally controlled synchronous servo motors. Actuation is just via the existing encoder cables, without further operations.

Software

The POSITool software can manage up to four separate position or speed regulated axes and control them alternately. A smooth transition from axis to axis is guaranteed by the software.
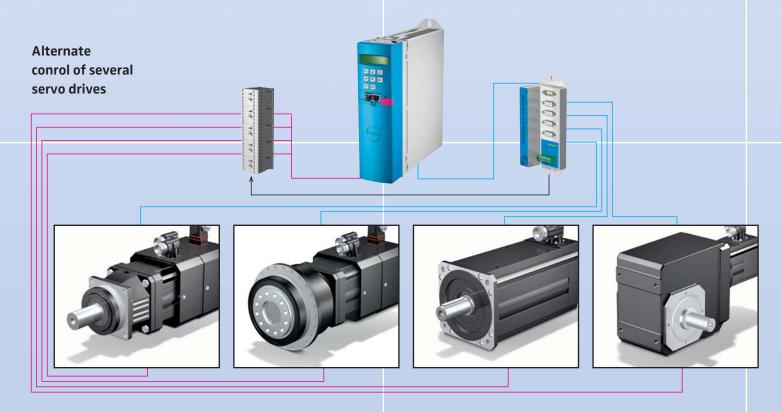
Power and signal flows are controlled with correct timing. The axis management does not require additional software complexity in a primary control.

POSISwitch® AX 5000

Sequential operation without functional limitation

If four drives are used as endless axes with absolute encoders, the exact positioning is still free from rounding errors even if the synchronous servo geared motors have different, also non whole number, gear ratios.

Alternate conrol of several servo drives

BRAKE CONTROL

Integrated actuation of motor brake and ServoStop motor adapter

The brake technology of the SMS synchronous servo geared motors is fully integrated in the braking management of software suite V5.

The brake management offers the following innovative functions for both brake systems
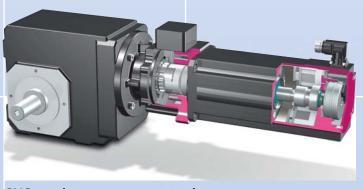- Cyclic brake test
- Brake run-in

Compliance with the individually preset parameters is tracked on the software side. If the brake test is omitted, the relevant axis shuts down.

The motor brake is controlled by the open load, short circuit and over-heating protective functions. The ServoStop motor adapter monitors brake wear with sensor technology.

Optional:
brake module BRS 5000

With the optional brake module BRS 5000, the POSIDYN® SDS 5000 servo inverter can control one or two 24 V brake systems.

SMS synchronous servo geared motor with redundant brakes

SMS synchronous servo geared motor with Servo-Stop and motor brake

SMS synchronous servo geared motors can also be equipped with ServoStop motor adapter.

The ServoStop motor adapter is a fail-safe spring-operated brake. It operates automatically in a power failure or emergency stop.
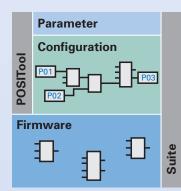
The ServoStop motor adapter is compatible with all SMS synchronous servo geared motors.

SOFTWARE SUITE V5

The software suite V5 consists of the commissioning software POSI-Tool, an extensive library of standard applications and the firmware for the 5000 inverter generation.

POSITool offers the following functions:
- Application configuration
- Drive parameterization
- Drive programming
- Drive commissioning
- Application commissioning
- Function optimization brake management
- Diagnostics

With the development of POSITool, a fully integrated 3-layer architecture has been created. It is convincing due to its clarity, optimum operational safety, program generation efficiency and accurate commissioning. All the parameterization work is supported by assistant functions.

Application library and parameterization assistant

The application library with tailor-made, project-related basic applications offers modules for:
- Fast reference value
- Technology controller
- Comfort reference value
  Speed or torque reference value (selectable)
  3 analog reference values
  16 fixed reference values
  Motorized potentiometer
  PID controller reference value
  Reference values scalable as absolute or percentage value
- Motion block positioning
- Command positioning with the special POSILatch function. Position measurements can then be taken on external signals (e.g. linear measurements).
- Synchronous command positioning
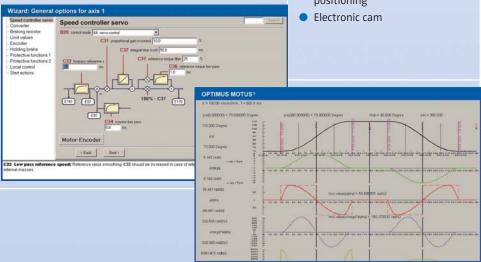- Electronic cam

For general users

Users are given active support with programming of standard applications because the modules are always project-oriented. The assistant function ensures that parameterization proceeds efficiently.

For experts

Trained and experienced users can use the graphics editor layer (with Motion Control in acc. w. PLCopen®) for configuration of customer applications.

Tailor made application

With this service STÖBER ANTRIEBS-TECHNIK provides the facility to have individual functional upgrades or full adaptations to basic applications specifically programmed. These programs have application protection.
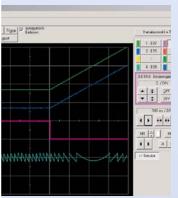

Quick, easy and accurate with the parameterization assistant

ACCURATE COMMISSIONING

Commissioning the STOBER ED, EK and EZ synchronous servo servo motors

Commissioning is by notebook computer and with the aid of POSITool. No software knowledge is required for this. All the adjustments are done interactively. The POSIDYN® SDS 5000 inverter comes supplied with the 'fast reference value' application.

STOBER EK synchronous servo motor with digital EnDat® 2.2 absolute encoder on the motor shaft (B-side)

Commissioning the complete application

This can be done either via the connected PC or after data transfer via the device operator panel.

The Paramodul is also suitable for data transfer.

Further parameterization corrections and additions can be made directly. Some knowledge (basic training) is necessary for this task.

Digital drive tuning

The POSIScope software tool reduces trial runs for individual drive optimization to a minimum.

Trial and error is replaced by a full diagnosis. In real time the procedure is observed, recorded, analyzed and immediately displayed by oscillograph on the PC monitor. The fine tuning thus obtained results in perfectly adjusted STOBER drives.

On applications with high specifications, POSIScope can be used for system maintenance.

Device replacement without expert knowledge

All the application parameters of a drive are stored in the Paramodul memory module in parallel with the device memory.

If a POSIDYN® SDS 5000 has to be replaced, the existing Paramodul is simply plugged in again to restart operations. The functionality is retained without restriction.

Functional modular housing design

The operator module is the same for all the sizes.

The sheet steel housing design is part of the STOBER EMC strategy. It shields against electromagnetic interference.

This increases the units' RFI immunity and reduces interference emission. The front is the only part made of plastic which is pleasant to the touch.
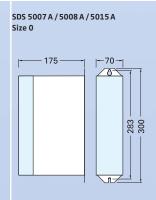
Connection layout

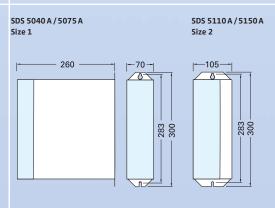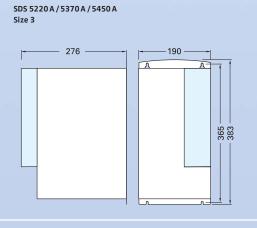The connections for motor, DC link and braking resistor are located on the bottom of the housing.

The mains or 24 V supply connection is made 'from above' through a plug-in terminal strip.

Installation

The POSIDYN® SDS 5000 servo inverters are suitable for installation in compact control cabinets 300 mm deep.

SDS 5007 A / 5008 A / 5015 A Size 0	SDS 5040 A / 5075 A Size 1	SDS 5110 A / 5150 A Size 2	SDS 5220 A / 5370 A / 5450 A Size 3

175 · 70 · 283 · 300

260 · 70 · 283 · 300

105 · 283 · 300

276 · 190 · 365 · 383

SYSTEM OVERVIEW

Powerful processor core
32-bit RISC processor
Current controller 62.5 μs
Position and speed controller 250 μs

Communication processor
For all IGB motion functionalities

Control modes
Synchronous servo motors
Asynchronous motors
(V/f, sensorless VC, VC)

Encoder interface
Absolute encoder, digital
(EnDat® 2.2, SSI)
Incremental encoder (TTL, HTL)
Optional: Resolver

Option board slots
Communication
I/O Terminals

Fieldbus moduls
PROFIBUS
PROFINET
EtherCAT®
CANopen®

I/O Terminal moduls
REA 5001
SEA 5001
XEA 5001

Operational reliability
Generously sized power stage
for 250 % accelerating current

Thermistor motor protection
Monitoring circuit for PTC thermis-
tors

Brake chopper integral
Thermal model monitoring of
external resistor for short circuit
and overload

DC link connection
For energy exchange between
several inverters

Operator unit
8 keys, changing of parameters,
manual operation (clear text
display and LED indicators)

Paramodul
Plug-in module for power failure
safe storage of all application
specific data. Data transfer without
any further aids

Control electronics supply
Power supply unit with connection
facility for external +24 V or DC
link power supply (the control sec-
tion remains fully functional even if
the supply voltage is switched off)

Ease of installation
All terminals are plug-in type
(spring-loaded terminals)
Supply and motor connections in
separate places
Twin DC link terminals, facilitates
parallel connection
EMC plate for mounting the shield
of the motor cable

Size	BG 0		
Type	SDS 5007 A	SDS 5008 A	SDS 5015 A
ID	55428	55429	55430
Recommended motor power	0.75 kW		1.5 kW
Input voltage	(L1–N) 1 x 230 V +20 %/–40 %, 50/60 Hz	(L1–L3) 3 x 400 V, +32 %/–50 %, 50 Hz (L1–L3) 3 x 480 V, +10 %/–58 %, 60 Hz	
Output frequency	0 to 700 Hz		
Output voltage	0 to 400 V		
Rated current I_{rated}	3 x 3 A	3 x 1.7 A	3 x 3.4 A
Maximum current I_{max}	250 % for 2 s; 200 % for 5 s		
Switching frequency	8 kHz (adjustable to 16 kHz with derating)		
Power loss at $I_{output} = I_{rated}$	80 W	65 W	90 W
Power loss at $I_{output} = 0$ A[1]	max. 30 W		
Overvoltage limit	440 V	830 V	
Brake chopper switching threshold	400 V to 420 V	780 V to 800 V	
Brake chopper interrupting voltage	360 V to 380 V	740 V to 760 V	
Braking resistor $R_{Br\ min}$	100 Ω		
Braking resistor $P_{Br\ max}$	1.8 kW	6.4 kW	

[1]Depends on the connected option boards and sensors (e.g. encoder)

POSITool Windows Software

Application selection
(with assistant)
Parameterization
(with assistant)

Manages several servo inverters in one installation Drive optimization with POSIScope, oscilloscope function for internal signals (movement visualization), operational data monitoring and diagnosis

Live firmware update

If the firmware is updated, the new version can be overwritten during system operation. The update can be made immediately or automatically at the next device start.

Accessories
POSISwitch® AX 5000

For sequential control of STOBER ED, EK + EZ synchronous servo motors with digital absolute encoders

Absolute Encoder Support AES

For buffering supply voltage when using the inductive Multiturn EnDat® 2.2 absolute encoder EBI1135 (when the 24 V power supply to the inverter has been switched off)

Submounted braking resistors

Braking resistors for installation at the rear of the unit

Braking resistor

VHPR series
IP 54 enclosure, UL
up to 400 W

ASP 5001

Option for the implementation of safety functions
● STO and SS1 as per
  EN 61800-5-2
● Stop category 0 and stop
  category 1 as per EN 60204

Integration is possible for applications up to (max.):
● PL e in category 3 as per
  EN ISO 13948-1:2008-12 and
● SIL 3 as per
  EN 61800-5-2:2008-04

CE compliance

All POSIDYN® SDS 5000 inverters conform to the applicable EMC Directives and meet the criteria of Low Voltage Directive EN 50178. Standard features comprise an effective range of measures, among them an integral EMC filter and the highquality galvanized sheet steel inverter housing. Levels and terms apply as defined by IEC 1131. All POSIDYN® servo inverters are CE-marked.

UL compliant

The inverters are UL and cUL ("Canadian UL") listed and meet the requirements of UL 508C and UL 840 standards.

BG 1		BG 2		BG 3		
SDS 5040 A	SDS 5075 A	SDS 5110 A	SDS 5150 A	SDS 5220 A	SDS 5370 A	SDS 5450 A
55431	55432	55433	55434	55435	55436	55437
4.0 kW	7.5 kW	11 kW	15 kW	22 kW	37 kW	45 kW
(L1–L3) 3 x 400 V, +32 %/–50 %, 50 Hz		(L1–L3) 3 x 400 V, +32 %/–50 %, 50 Hz		(L1–L3) 3 x 400 V, +32 %/–50 %, 50 Hz		
(L1–L3) 3 x 480 V, +10 %/–58 %, 60 Hz		(L1–L3) 3 x 480 V, +10 %/–58 %, 60 Hz		(L1–L3) 3 x 480 V, +10 %/–58 %, 60 Hz		
0 to 700 Hz		0 to 700 Hz		0 to 700 Hz		
0 to 400 V		0 to 400 V		0 to 400 V		
3 x 6 A	3 x 10 A	3 x 14 A	3 x 20 A	3 x 30 A	3 x 50 A	3 x 60 A
250 % for 2 s; 200 % for 5 s		250 % for 2 s; 200 % for 5 s		250 % for 2 s; 200 % for 5 s		
8 kHz (adjustable to 16 kHz with derating)		8 kHz (adjustable to 16 kHz with derating)		8 kHz (adjustable to 16 kHz with derating)		
170 W	200 W	220 W	280 W	ca. 350 W	ca. 600 W	ca. 1000 W
max. 30 W		max. 30 W		max. 55 W		
830 V		830 V		830 V		
780 V to 800 V		780 V to 800 V		780 V to 800 V		
740 V to 760 V		740 V to 760 V		740 V to 760 V		
47 Ω		22 Ω		15 Ω		
6.4 kW	13.6 kW	29.1 kW		42.7 kW		

THE COMPLETE HARDWARE

The optimized system technology.
POSIDYN® SDS 5000 and SMS synchronous servo geared motors

The SMS servo product range comprises ServoFit® gear units which are directly mounted on the STOBER ED, EK and EZ synchronous servo motors to form the SMS synchronous servo geared motors.

For higher safety requirements for SMS synchronous servo geared motors, the ServoStop motor adapter brake can be used as a redundant braking system.

The new SMS KS right-angle servo geared motor has created a further series designed as a compact complete drive. The SMS right-angle servo geared motor stands for extremely high demands on dynamics or continuous duty endurance at a high speed level.

Digital encoder interface
● New EnDat® format 2.2
● 4 MHz data rate
● Up to 100 m cable length

Display and keypad are integrated. So rapid diagnosis, status monitoring, direct parameter access and jogging (manual operation functions) are possible.

Advanced seminars for general users and experts

The POSITool software assistant supports configuration and parameterisation of the STOBER standard applications. Basic and advanced information on the safe handling of POSITool necessary on the job can be acquired at an application seminar.

In practical, individually designed seminars, general users learn the ways in which they can utilise the potential of the POSITool standard applications fully and effectively.

After attending the 'Free Graphic Programming' seminar, experts can expand the POSITool standard applications themselves to adapt them to specific needs.

Further information and dates can be found on our website www.stoeber.de (Services).

Service

The STOBER service system comprises 38 expert partners in Germany and more than 80 companies in the STOBER SERVICE NETWORK worldwide.

This service concept guarantees local expertise and availability when needed.

In general, the service specialists can be reached at any time via a 24/7 service hotline.

When necessary, a problem can be addressed immediately.

**24/7 service hotline
+49 180 5 786323**

STÖBER