



STÖBER

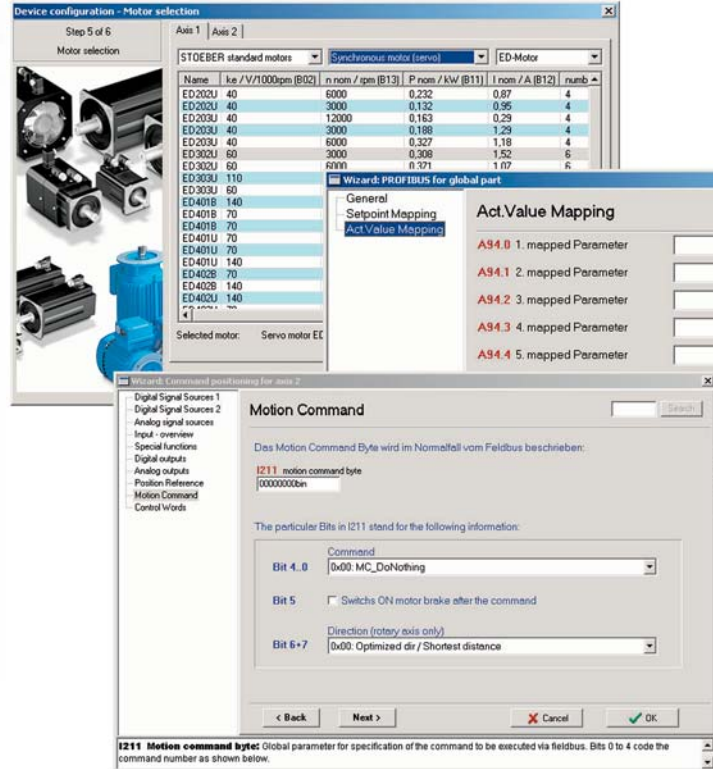
POSIDRIVE® MDS 5000



GO DIGITAL!



THE FULLY DIGITAL POSITIONING AXIS



THE FIRST COMPLETE SYSTEM FOR EFFICIENT AUTOMATION

With the development of the POSIDRIVE® MDS 5000 servo inverter, STÖBER ANTRIEBS-TECHNIK is launching a total revision of the hardware and software for the servo system.

The data communication between the POSIDRIVE® MDS 5000 and the STÖBER ED EK and EZ servo motors is now entirely digital.

The main factor allowing rational realization of this fully digital servo axis lies in the development of fully digital absolute encoders at industrial-scale prices. The STÖBER servo motors in the ED, EK and EZ series are equipped with these devices.

Innovative software generation

The commissioning software POSITool is based on a completely new, modular 3-layer architecture with ergonomic interface design. An applications library with parameterization assistant and an additional flexible graphics programming facility forms a successful bridge between custom-made design and universality. This new system technology brings to an end the era of overloaded and confusing operating programs from the pioneering period of inverters.

The benefits are obvious

This comprehensive and rational slimming down of the system results in significant cost benefits for hardware, configuration, cabling, installation and commissioning.

The close coordination of all the STÖBER servo components is clear from the example of the electronic motor rating plate. Its data is used automatically in the parameterization of the POSIDRIVE® MDS 5000 servo inverter.



STÖBER EK servo motor with digital absolute valuator (standard version)



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 POSIDRIVE® MDS 5000 servo inverter is suitable for these applications.

The digital technology makes it possible

For the first time the inexpensive and reliable axis changeover application is available for unrestricted use on servo drives.

Axis changeover switch

The POSISwitch® AX 5000 external module has been developed for connection of the digitally controlled 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.

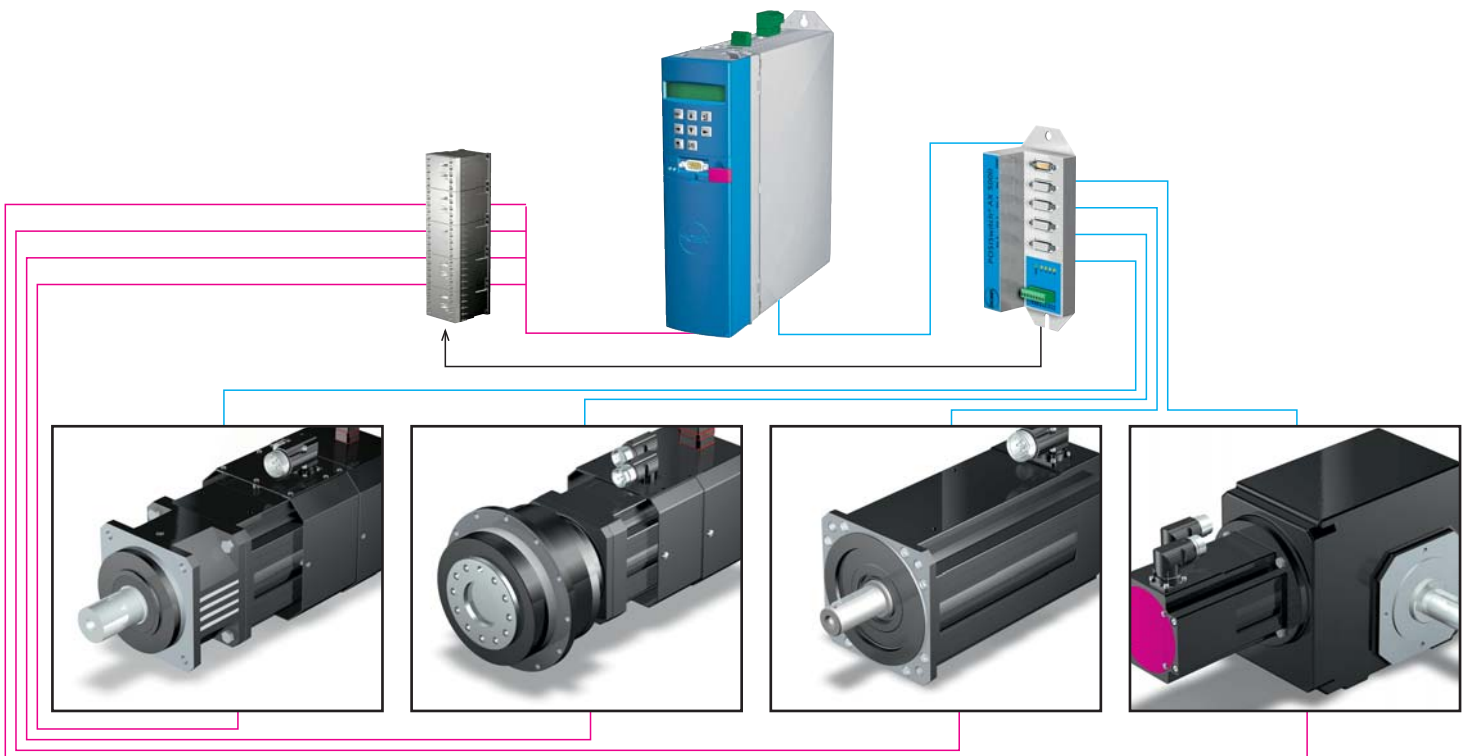
Sequential operation without functional limitation

If four drives are used as endless axes with absolute encoders, the exact positioning is still free from rounding errors even if the gear units have different and non-integer gear ratios.



POSIswitch® AX 5000

ALTERNATE CONTROL OF SEVERAL SERVO DRIVES

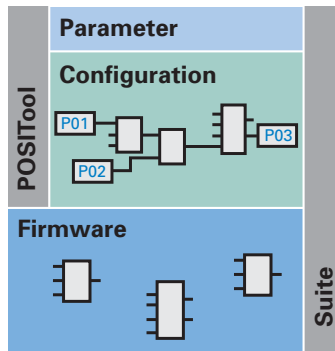


MODULAR SOFTWARE ARCHITECTURE

The rapid pace of developments in electronics is leading to continuous improvements and expanded functions, especially in frequency inverters, and yet this is associated with constant growth in user software complexity. A trend which is in stark contrast to the demand for simpler and more accurate usability.

This conflict of objectives has been addressed by STÖBER ANTRIEBSTECHNIK and Software Suite V5 developed as a solution. This suite includes the commissioning software POSITool, a comprehensive library with standard applications, as well as the firmware for the inverter generation 5000.

Instead of rigidly defined firmware with an endless number of parameter variations the user has a modern, ergonomically designed operator interface.



Scalable software architecture

For everyday

To configure a drive, the commissioning software POSITool offers a library with typical preproduced basic applications. Here is a selection:

- Fast reference value
- 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
- Command positioning
 - Powerful single axis positioning control with command interface in accordance with PLCopen and the additional function POSILatch. Position measurements can then be taken on external signals (e.g. linear measurements)
- Motion block positioning
- Electronic cam function
 - Connection of up to 32 axes

The consistent project orientation of the modules is proving extremely effective.

The parameterization work is supported by assistant functions.

For experts

The new, user programmable firmware has been upgraded to include a graphics editor layer in conformance with PLCopen. An experienced or trained user will find a variety of predefined function blocks in various libraries. With these, basic applications can be modified or given extra functions.

Extra service

For a completely new functionality requirement or for comprehensive adaptation of the basic application, STÖBER ANTRIEBSTECHNIK offers this as "tailor-made applications" service.

Other highlights

The software scalability allows optimum adaptation of functionality and response time to the application. The cycle time for setpoint processing depends only on the calculation of the activated system modules and the parameters.

Complex applications can also be mapped on the same hardware platform without modifying the firmware.

The STÖBER POSISwitch® AX 5000 axis changeover switch is prepared for use on the software side. Up to 4 servo axes with different functionalities can be controlled alternately.

MODULAR H

Functional housing design

As part of the STÖBER EMC strategy, all the housings in the POSIDRIVE® MDS 5000 series are made of galvanized sheet steel. They shield against electromagnetic interference and thus increase the units' RFI immunity and reduce interference emission.

The front housing is made of high-impact plastic and incorporates the operator keypad, display, LED indicators, Paramodul and RS232 interface, along with the slots for the optional boards and terminals.

The same design plastic front housing is used for all the sizes.

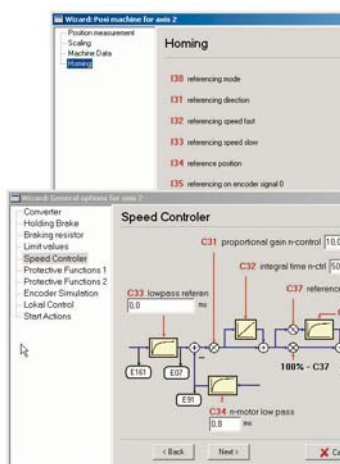


Paramodul

Plug-in memory module for transfer of all program and settings data.

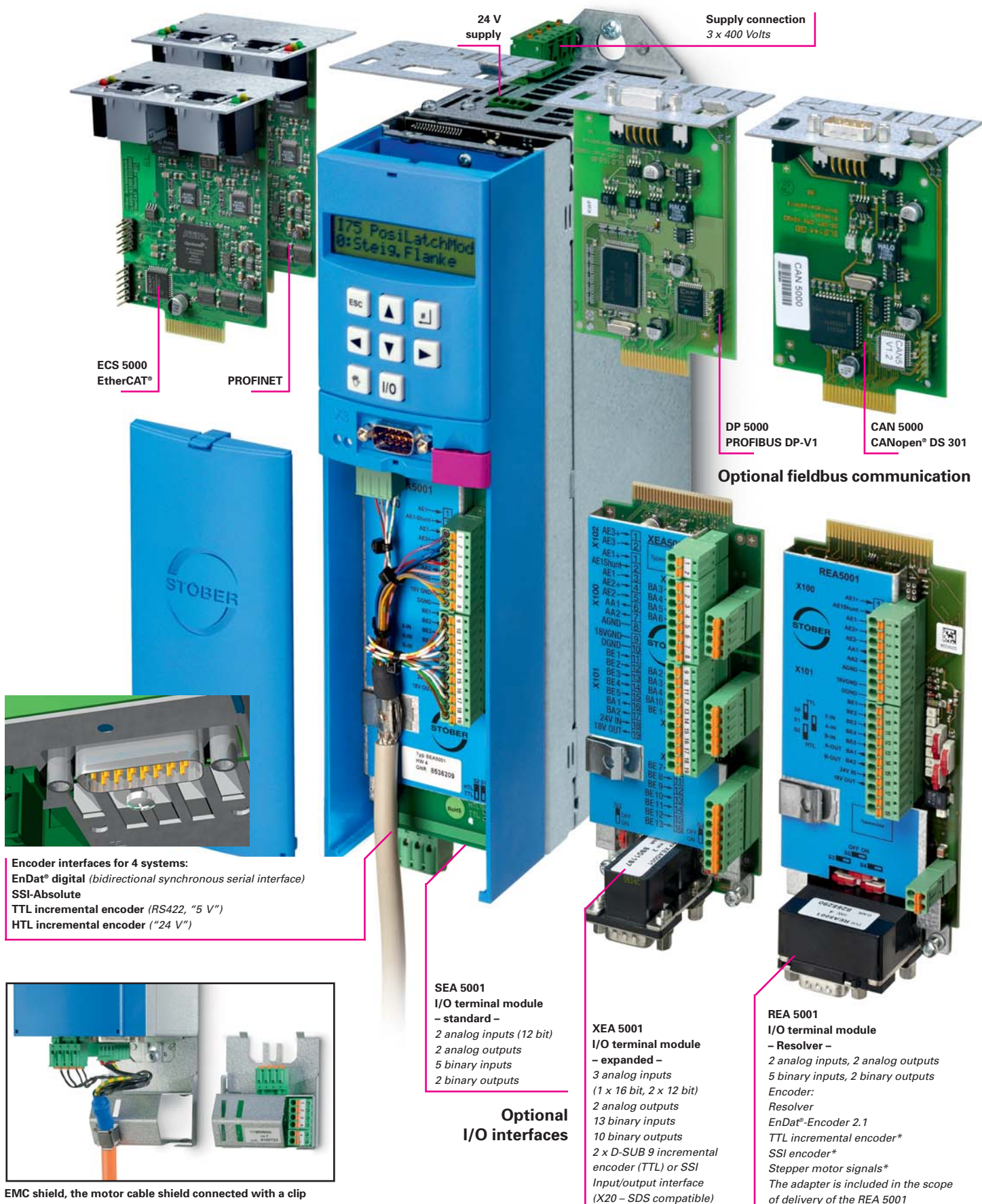
If a POSIDRIVE® MDS 5000 has to be replaced, the existing Paramodul is simply plugged in again to restart operations. The functionality is retained without restriction.

This plug-in memory module is also an ideal, immediately available tool for documentation updating of operating conditions.



SYSTEM CONCEPT OF TOTAL MODULARITY

ARDWARE STRUCTURE



ECS 5000
EtherCAT®

PROFINET

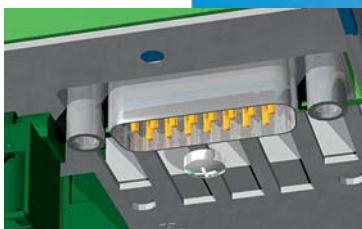
24 V
supply

Supply connection
3 x 400 Volts

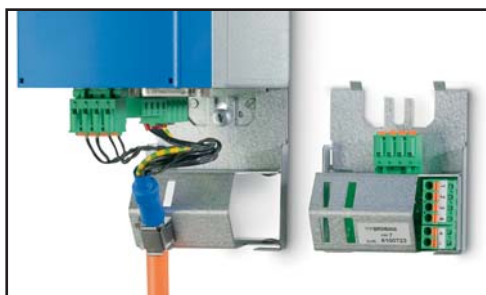
DP 5000
PROFIBUS DP-V1

CAN 5000
CANopen® DS 301

Optional fieldbus communication



Encoder interfaces for 4 systems:
 EnDat® digital (bidirectional synchronous serial interface)
 SSI-Absolute
 TTL incremental encoder (RS422, "5 V")
 HTL incremental encoder ("24 V")



SEA 5001
 I/O terminal module
 – standard –
 2 analog inputs (12 bit)
 2 analog outputs
 5 binary inputs
 2 binary outputs

Optional
 I/O interfaces

XEA 5001
 I/O terminal module
 – expanded –
 3 analog inputs
 (1 x 16 bit, 2 x 12 bit)
 2 analog outputs
 13 binary inputs
 10 binary outputs
 2 x D-SUB 9 incremental
 encoder (TTL) or SSI
 Input/output interface
 (X20 – SDS compatible)

REA 5001
 I/O terminal module
 – Resolver –
 2 analog inputs, 2 analog outputs
 5 binary inputs, 2 binary outputs
 Encoder:
 Resolver
 EnDat®-Encoder 2.1
 TTL incremental encoder*
 SSI encoder*
 Stepper motor signals*
 The adapter is included in the scope
 of delivery of the REA 5001

EMC shield, the motor cable shield connected with a clip
 On the right: Version with integral brake module for 24 V brake

*(Simulation and evaluation)

THE COMPLETE RANGE FROM 0.37 TO 45 KW

Functional modular housing design

The operator module is the same for all the sizes.

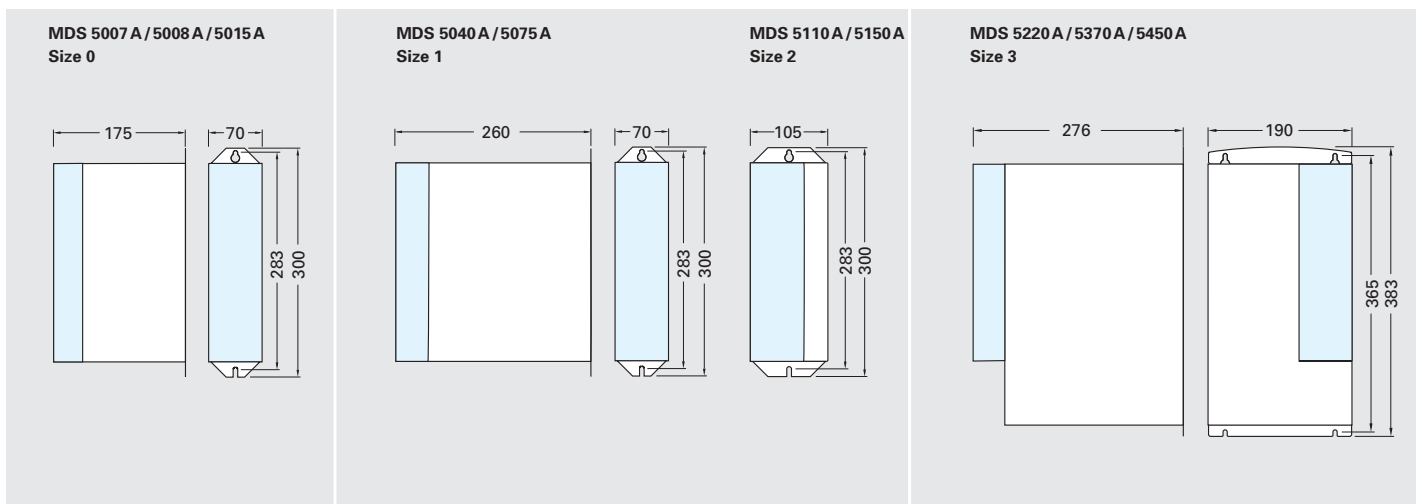
The sheet steel housing design is part of the STÖBER EMC strategy (filter class A). It shields against electromagnetic interference.

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.



Installation

The POSIDRIVE® MDS 5000 servo inverters can be mounted in compact control cabinets 300 mm deep.



SYSTEM BASIS

Powerful processor core

32-bit RISC processor
Current controller 125 μ s

Control modes

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

Encoder interface

Absolute encoder, digital
(EnDat[®], SSI)
Incremental encoder (TTL, HTL)
Optional: Resolver

Serial interface

RS232 with USS protocol

Option board slots

Communication
I/O Terminals

Operational reliability

Generously sized power stage
for 250 % accelerating current

Thermistor motor protection

PTC thermistor monitoring

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 fail-
ure safe storage of all application
specific data.

Data transfer without any fur-
ther aids

Control electronics supply

Power supply unit with connec-
tion facility for external +24V or
DC link power supply

(the control section remains
fully functional even if the sup-
ply voltage is switched off)

Ease of installation

All terminals plug-in type
(spring-loaded terminals)
Supply and motor connections
in separate places
DC link terminals, two of each,
facilitate parallel connection
EMC plate for shield connection

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

POSITool Windows Software

Application selection
(with assistant)
Parameterization
(with assistant)

Manages several servo inverters
in one installation Drive optimi-
zation with POSIScope, oscillo-
scope function for internal
signals (movement visualiza-
tion), operational data moni-
toring and diagnosis



The POSILatch function uses external
signals and evaluates them as measure-
ment function.
POSITatch can replace a separate PLC
measuring system

| Size | Size 0 | | | Size 1 | |
|-------------------------|--|--|------------|--|------------|
| | MDS 5007 A | MDS 5008 A | MDS 5015 A | MDS 5040 A | MDS 5075 A |
| ID | 55401 | 55402 | 55403 | 55404 | 55405 |
| Recommended motor power | 0.75 kW | 0.75 kW | 1.5 kW | 4.0 kW | 7.5 kW |
| Supply 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 | | (L1-L3) 3 x 400 V +32%/-50% 50 Hz (L1-L3) 3 x 480 V +10%/-58% 60 Hz | |
| Line fuses | 1 x 10 AT | 3 x 6 AT | 3 x 10 AT | 3 x 16 AT | 3 x 20 AT |

Operation with servo motor (servo control mode)

| | | | | | |
|---------------------|--|-----------|-----------|--|----------|
| Rated current I_R | 3 x 3 A | 3 x 1.7 A | 3 x 3.4 A | 3 x 6.0 A | 3 x 10 A |
| I_{max} | 250 % / 2 sec., 200 % / 5 sec. | | | 250 % / 2 sec., 200 % / 5 sec. | |
| Switching frequency | 8 kHz (adjustable to 16 kHz with derating) | | | 8 kHz (adjustable to 16 kHz with derating) | |

Operation with three-phase AC motor (V/f, SLVC, VC control modes)

| | | | | | |
|---------------------|--|-----------|-----------|--|----------|
| Rated current I_R | 3 x 4 A | 3 x 2.3 A | 3 x 4.5 A | 3 x 10 A | 3 x 16 A |
| I_{max} | 180 % / 5 sec., 150 % / 30 sec. | | | 180 % / 5 sec., 150 % / 30 sec. | |
| Switching frequency | 4 kHz (adjustable to 16 kHz with derating) | | | 4 kHz (adjustable to 16 kHz with derating) | |

| | | | | | |
|--|------------------------------------|----------------------------|--|------------------------------------|----------------------------|
| Braking resistor internal | - | | | - | |
| Braking resistor external | 100 Ω : max. 1.6 kW | 100 Ω : max. 3.2 kW | | 47 Ω : max. 6.4 kW | 47 Ω : max. 13.2 kW |
| Permissible motor cable length, shielded | 100 m, from 50 m with output choke | | | 100 m, from 50 m with output choke | |
| Conductor cross-section | max. 2.5 mm ² | | | max. 4 mm ² | |
| Enclosure | IP 20 | | | IP 20 | |
| Weight kg (without packing) | 2.2 | | | 3.8 | |
| Output frequency | 0 – 700 Hz | | | 0 – 700 Hz | |

SYSTEM OPTIONS

CE compliance

All POSIDRIVE® MDS 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 high-quality galvanized sheet steel inverter housing. Levels and terms apply as defined by IEC 1131.

All POSIDRIVE® 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

Absolute Encoder Support AES

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

Fieldbus communication

PROFIBUS
PROFINET
EtherCAT®
CANopen®

I/O terminal module

SEA 5001
XEA 5001 (incremental encoder and SSI interfaces)
REA 5001
Resolver and
EnDat® Encoder 2.1 interface

POSISwitch® AX 5000

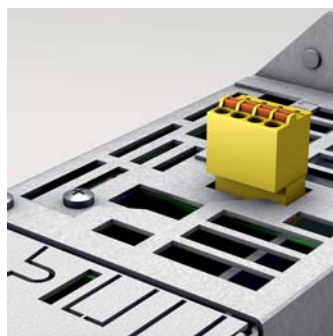
For sequential control of STÖBER ED, EK and EZ servo motors with digital absolute encoders.

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
Starting lockout



VHPR
Braking resistor

| | Size 2 | | Size 3 | | |
|------|--|------------|--|-------------|-------------|
| | MDS 5110 A | MDS 5150 A | MDS 5220 A | MDS 5370 A | MDS 5450 A |
| | 55406 | 55407 | 55408 | 55409 | 55410 |
| | 11 kW | 15 kW | 22 kW | 37 kW | 45 kW |
| | (L1-L3) 3 x 400 V +32%/-50% 50 Hz (L1-L3) 3 x 480 V +10%/-58% 60 Hz | | (L1-L3) 3 x 400 V +32%/-50% 50 Hz (L1-L3) 3 x 480 V +10%/-58% 60 Hz | | |
| | 3 x 35 AT | 3 x 50 AT | 3 x 50 A gG | 3 x 80 A gG | 3 x 85 A gG |
| | 3 x 14 A | 3 x 20 A | 3 x 30 A | 3 x 50 A | 3 x 60 A |
| | 250% / 2 sec., 200% / 5 sec. | | 250% / 2 sec., 200% / 5 sec. | | |
| | 8 kHz (adjustable to 16 kHz with derating) | | 8 kHz (adjustable to 16 kHz with derating) | | |
| | 3 x 22 A | 3 x 32 A | 3 x 44 A | 3 x 70 A | 3 x 85 A |
| | 180% / 5 sec., 150% / 30 sec. | | 180% / 5 sec., 150% / 30 sec. | | |
| | 4 kHz (adjustable to 16 kHz with derating) | | 4 kHz (adjustable to 16 kHz with derating) | | |
| | - | | 30 Ω: 100 W / max. 21 kW | | |
| 6 kW | 22 Ω: max. 29.1 kW | | 15 Ω: max. 42 kW | | |
| | 100 m, from 50 m with output choke | | 100 m | | |
| | max. 6 mm ² | | max. 35 mm ² without connector sleeve | | |
| | IP 20 | | IP 20 | | |
| | 5.0 | | 11.8 | 13.2 | |
| | 0 – 700 Hz | | 0 – 700 Hz | | |

ACCURATE COMMISSIONING

The Windows commissioning software POSITool contains the following functions:

- Application configuration
- Drive parameterization
- Drive programming
- Drive commissioning
- Application commissioning
- Function optimization

The prepared functions and parameters are transferred via the RS232 interface on the device front.



STÖBER EK servo motor with digital absolute encoder on the motor shaft (B side)

Commissioning the STÖBER ED, EK and EZ servo motors

No software knowledge is necessary for this preparation work. All the adjustments are done by dialog via the operator panel with text display. The POSIDRIVE® MDS 5000 servo inverter comes supplied with the "rapid set point" application.



Commissioning the complete application

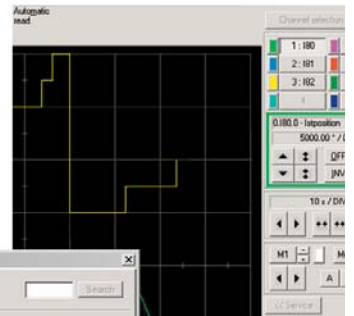
This can be done either via the connected PC or after data transfer via the device operator panel. The Paramodul is also suitable for data transfer. Further parameterization corrections and additions can be made directly. Some knowledge (basic training) is necessary for this task.

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 drives.

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



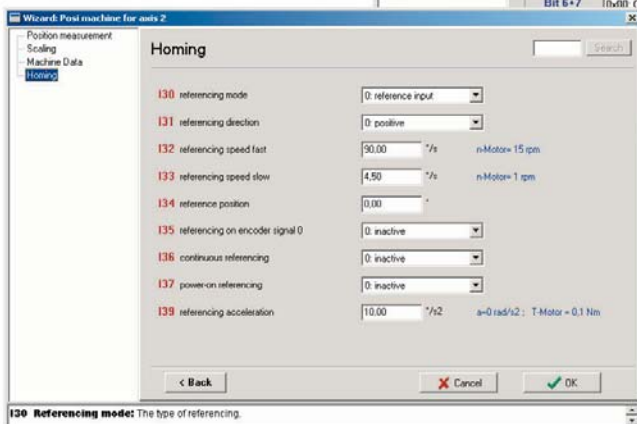
Advanced seminars for general users and experts

The POSITool software assistant supports configuration and parameterisation of the STÖBER 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.stoerber.de (Services).



130 Referencing mode: The type of referencing.

QUICK TO ASSEMBLE

Perfect, practical connection layout



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



The separate connections for motor, DC link and braking resistor are located on the bottom of the housing. The PTC thermistor and braking relay are also attached here by simple plug-in mounting.



Quick DC link connection. Double DC link permit enable simplified parallel connection.

VERY EASY TO USE



Easy data transfer and acceptance by Paramodul.



Display and keypad are integrated. Rapid diagnosis, status monitoring, direct parameter access and manual operating functions are possible.

Service

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

This full service concept guarantees local expertise and availability when needed.

In general, the service specialists in the Pforzheim factory 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 (0)180 5 786323

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