



## 5 POSIDYN SDS 5000 servo inverters

### Table of contents

5.1	Overview.....	117
5.1.1	Features .....	118
5.1.2	Software components .....	120
5.1.3	Application training.....	121
5.2	Technical data .....	122
5.2.1	Symbols in formulas.....	122
5.2.2	Type designation.....	123
5.2.3	Sizes .....	123
5.2.4	General technical data .....	124
5.2.5	Electrical data.....	125
5.2.6	Derating by increasing the clock frequency .....	131
5.2.7	Dimensions .....	132
5.2.8	Minimum clearances .....	134
5.3	Inverter/motor combination.....	135
5.4	Accessories .....	138
5.4.1	Safety technology.....	138
5.4.2	Communication .....	138
5.4.3	Terminal module .....	139
5.4.4	Braking resistor .....	141
5.4.5	TEP output choke.....	148
5.4.6	Brake module and EMC shroud.....	151
5.4.7	Axis switcher .....	152
5.4.8	Battery module for encoder buffering.....	152
5.4.9	Removable data storage.....	153
5.4.10	Product CD.....	153
5.5	Further information .....	153
5.5.1	Symbols, identifiers and test marks .....	153





## 5.1 Overview

High dynamics for fully digital servo axes

SDS

### Features

- Nominal output current up to 60 A (at 8 kHz clock frequency)
- 250% overload capacity
- Power range: 0.75 kW to 45 kW
- Control of rotary synchronous servo motors and asynchronous motors
- EnDat 2.1/2.2 digital, SSI, incremental (HTL/TTL) or resolver encoder interfaces
- Automatic motor parameterization from the electronic motor nameplate
- Isochronic system bus (IGB) for parameterization and multi-axis applications
- Communication via PROFIBUS DP, PROFINET, CANopen, EtherCAT
- Safe Torque Off (STO) and Safe Stop 1 (SS1) safety functions: SIL 3, PL e, category 3
- Digital and analog inputs and outputs
- Integrated brake chopper
- Brake management for two 24 V holding brakes
- Integrated line filter
- Motor temperature evaluation using PTC thermistors, KTY or Pt1000 temperature sensors
- Standard applications with speed, torque, positioning and master/slave functionality
- Programming based on IEC 61131-3 with CFC for creating applications
- Fast commissioning with POSITool software
- Convenient operating unit consisting of plain text display and keyboard
- Paramodul removable data storage for commissioning and service
- Secured remote maintenance concept

## SDS 5000





### 5.1.1 Features

The 5th generation series of STOBBER inverters are purely digital, modular inverter systems for operating rotary synchronous and asynchronous motors. It includes product types for direct operation on a one or three-phase network in a voltage range from 200 V<sub>AC</sub> to 528 V<sub>AC</sub>. An EMC line filter is integrated. EnDat 2.1/2.2 digital, SSI and incremental (HTL/TTL) are available as encoder interfaces in the standard version. Resolver evaluation is possible as an option. STOBBER synchronous servo motors are ideally intended for operation with the EnDat 2.1/2.2 digital encoder. These encoder systems can deliver the highest control quality. Motor parameterization can be derived automatically from the electronic motor nameplate. The inverter can be adapted to the requirements of individual applications using different option modules. The ASP 5001 safety module makes it possible to implement the Safe Torque Off (STO) and Safe Stop 1 (SS1) safety functions in accordance with DIN EN ISO 13849-1 and DIN EN 61800-5-2 for safety-relevant applications. The communication modules enable connection to a controller using PROFIBUS DP, PROFINET, CANopen or EtherCAT fieldbuses. Terminal modules offer the option of connecting analog and binary signals as well as additional encoder signals. A plain text display and keyboard simplify diagnostics in the event of a fault and enable fast access to parameters. The Paramodul removable data storage can be used to transfer all application-relevant data from one inverter to another.



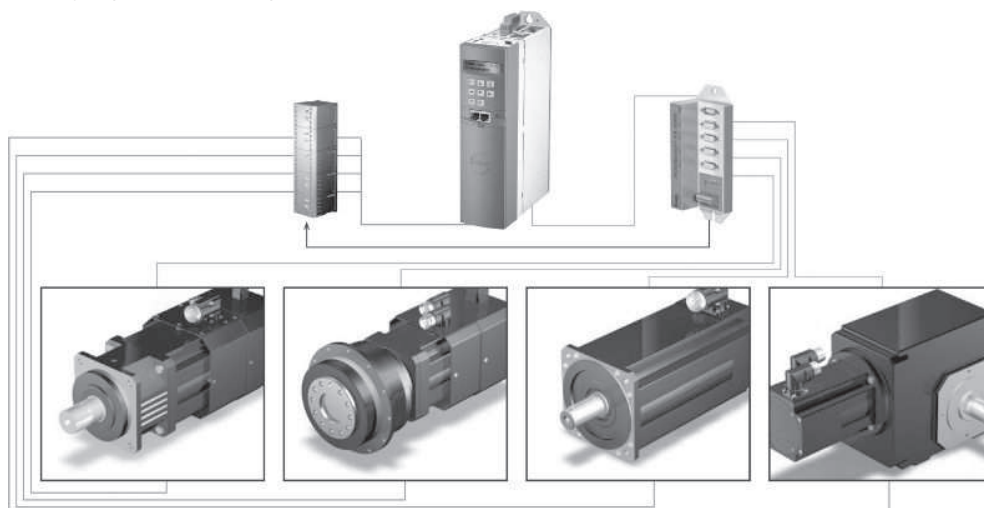
*POSIDYN SDS 5000*



*POSIDRIVE MDS 5000*

#### Sequential axis switching with POSISwitch AX 5000

The POSISwitch AX 5000 accessory allows for up to four synchronous servo motors to be operated on one inverter sequentially using the EnDat 2.1/2.2 digital absolute encoder. The POSISwitch AX 5000 module is used to switch absolute encoder signals as well as control signals for brake and motor line switching. Switching is easy and EMC interference-free thanks to the entirely digital encoder signals with EnDat protocol.



**Integrated bus (IGB) for performance, convenience and safety**

POSIDYN 5000 servo inverters have two interfaces for the integrated bus in the standard version. The integrated bus is used for easy project configuration over Ethernet and isochronic data exchange for the following functions:

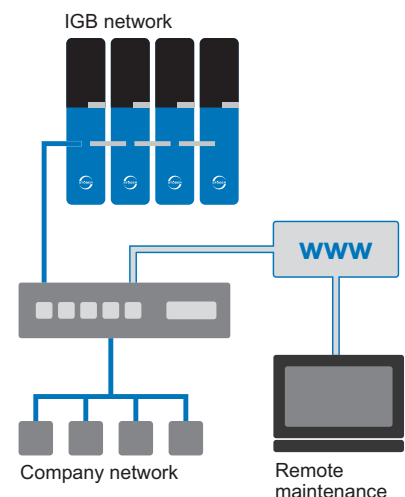
- Multi-axis synchronization between the servo inverters (IGB motion bus)
- Internet connection for remote maintenance of individual and multiple inverters
- Direct connection between servo inverter and PC

**IGB motion bus**

The IGB motion bus allows for cyclic, isochronic data exchange between multiple POSIDYN SDS 5000 units integrated into the IGB network. In addition to transferring guide values for master/slave operation, any other data items can also be exchanged, such as tailor-made applications.

**STOBER remote maintenance concept**

STOBER remote maintenance enables commissioning software to be used to perform all processes and sequences just like an on-site service visit. The concept guides users through a controlled and protected procedure. It ensures that the person responsible for the machine is there on site to pay attention to special situations and personal safety. On the other end, the remote maintenance specialist has the assurance of communicating with a responsible employee on site who is monitoring the situation on the machine.

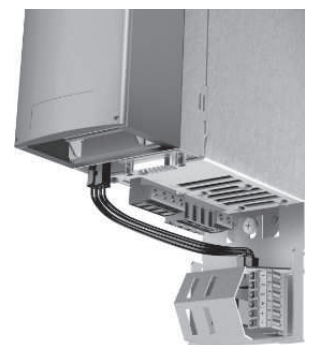


*Remote maintenance can be used to perform all processes and sequences just like an on-site service visit.*

**Brake management**

The POSIDYN SDS 5000 servo inverter can control one or two 24 V brake systems with the optional BRS 5001 brake module. Brake management provides the following functions for both brake systems:

- Cyclic brake test
- Grind brake



*Optionally available: BRS 5001 brake module*



### POSITool

The 5th generation of POSITool project configuration and commissioning software has all the functions needed for efficient use of inverters in single and multi-axis applications.

### Paramodul removable data storage

Removable data storage for fast series commissioning by copying and easy service when replacing devices.



## 5.1.2 Software components

### Modular application software

Various standard applications can be loaded onto the devices of the 5th STOBER inverter generation with the POSITool commissioning software as needed. Furthermore, programming based on IEC 61131-3 with CFC can be used to create new applications or expand existing ones. The inverter operating system is multi-axis capable. It supports up to four axes with separate application and parameter ranges.

### Velocity mode (standard application)

- **Fast reference value**  
Simple speed application for lean applications. The speed reference value and torque limiting can be specified using analog inputs as well as digitally.

### Torque/force and velocity mode (standard application)

- **Comfort reference value**  
Expanded torque and speed reference value application. Reference values and limits can be assigned with the fast reference value as well as using fixed values, motor potentiometers and other functions.
- **Technology controller**  
PID controller for torque or speed-controlled applications.

### Positioning and master/slave mode (standard application)

- **Command, synchronous command**  
High-performance positioning application with a command interface based on PLCopen. The data for a motion task including target position, velocity and acceleration are transferred together over fieldbus to the inverter, which then processes them independently. The functional scope is rounded out by an electrical cam, motion block switching point and Posi-Latch.
- **Motion block**  
Extensive positioning application with up to 256 motion blocks based on PLCopen. The motion blocks can be selected individually over fieldbus or with binary inputs. They can also be started in a chain. The functional scope is rounded out by an electrical cam, motion block switching point and Posi-Latch.



### Electronic cam disk with PLCopen interface (tailor-made applications)

The electronic cam disk application makes it possible to implement complex motion tasks such as:

- Flying saw
- Synchronizer (clock in/clock out)
- Cross cutter
- Welding bar/embossing stamp
- Print mark control

These applications can be implemented quickly and easily using readily understandable, free graphical programming based on IEC 61131-3 CFC. This also allows for customer-specific adaptations to special system conditions. Function blocks based on PLCopen Motion Control are available for this purpose for trained users.

## 5.1.3 Application training

STOBER offers a multi-level training program that focuses essentially on application programming of the motion controller and inverter.

### G5 Basic

Training content: System overview, installation and commissioning of the inverter. Use of option modules. Parameterization, commissioning and diagnostics using the integrated display and commissioning software. Remote maintenance. Basics of controller optimization. Configuration of the drive train. Integrated software functions. Software applications. Connection to a higher-level controller. Basics of safety technology. Practical exercises on training topics.

Software used: POSITool.

### G5 Advanced

Training content: Graphical programming with CFC. Special knowledge for regulating, control and safety technology. Practical exercises on training topics.

### G5 CAM

Training content: Special knowledge of electronic cam disks. Practical exercises on training topics.



## 5.2 Technical data

Technical data for inverters can be found in the following sections.

### 5.2.1 Symbols in formulas

Formula symbol	Unit	Explanation
$f_{2PU}$	Hz	Output frequency of the power unit
$f_N$	Hz	Rotating magnetic field frequency at nominal speed
$f_{PWM,PU}$	Hz	Internal pulse clock frequency of the power unit
$I_0$	A	Stall current: RMS value of the line-to-line current when the stall torque $M_0$ is generated (tolerance $\pm 5\%$ )
$I_{1N,PU}$	A	Nominal input current of the power unit
$I_{2maxPU}$	A	Maximum output current of the power unit
$I_{2N,PU}$	A	Nominal output current of the power unit
$I_N$	A	Nominal current
$I_{N,MOT}$	A	Nominal current of the motor
$K_{EM}$	V/rpm	Voltage constant: Peak value of the induced motor voltage at a speed of 1000 rpm and a winding temperature $\Delta\vartheta = 100$ K (tolerance $\pm 10\%$ )
$M_0$	Nm	Stall torque: The continuous torque the motor is able to deliver at a speed of 10 rpm (tolerance $\pm 5\%$ )
$M_N$	Nm	Nominal torque: the maximum torque of a motor in S1 mode at nominal speed $n_N$ (tolerance $\pm 5\%$ )
$n_N$	rpm	Nominal speed: The speed for which the nominal torque $M_N$ is specified
$p$		Number of pole pairs
$P_{maxRB}$	W	Maximum power at the external braking resistor
$P_V$	W	Power loss
$P_{V,CU}$	W	Power loss of the control unit
$R_{2minRB}$	$\Omega$	Minimum resistance of the external braking resistor
$R_{intRB}$	$\Omega$	Resistance of the internal braking resistor
$\vartheta_{amb,max}$	$^{\circ}C$	Maximum surrounding temperature
$T_{th}$	$^{\circ}C$	Thermal time constant
$U_{1PU}$	V	Input voltage of the power unit
$U_{2PU}$	V	Output voltage of the power unit
$U_{max}$	V	Maximum voltage
$U_{maxPU}$	V	Maximum voltage of the power unit
$U_{offCH}$	V	Off limit of the brake chopper
$U_{onCH}$	V	On limit of the brake chopper





## 5.2.2 Type designation

SDS	5	075	A
-----	---	-----	---

Tab. 1: Sample code

Code	Designation	Design
SDS	Series	
5	Generation	Generation 5
075	Power	075 = 7.5 kW
–	Hardware variants	No identification: HW 199 or lower
A		A: HW 200 or higher

Tab. 2: Explanation

## 5.2.3 Sizes

Type	ID No.	Size
SDS 5007A	55428	Size 0
SDS 5008A	55429	Size 0
SDS 5015A	55430	Size 0
SDS 5040A	55431	Size 1
SDS 5075A	55432	Size 1
SDS 5110A	55433	Size 2
SDS 5150A	55434	Size 2
SDS 5220A	55435	Size 3
SDS 5370A	55436	Size 3
SDS 5450A	55437	Size 3

Tab. 3: Available SDS 5000 types and sizes



Fig. 1: SDS 5000 in sizes 3, 2, 1 and 0



## 5.2.4 General technical data

Device features	
Protection class of the device	IP20
Protection class of the control cabinet	At least IP54
Radio interference suppression	Integrated line filter in accordance with EN 61800-3:2012, interference emission class C3
Overvoltage category	III in accordance with EN 61800-5-1:2008

Tab. 4: Device features

Transport and storage conditions	
Storage/ transport temperature	-20 °C to +70 °C Maximum change: 20 °C/h
Relative humidity	Maximum relative humidity 85%, non-condensing
Vibration (transport) in accordance with DIN EN 60068-2-6	5 Hz ≤ f ≤ 9 Hz: 3.5 mm 9 Hz ≤ f ≤ 200 Hz: 10 m/s <sup>2</sup> 200 Hz ≤ f ≤ 500 Hz: 15 m/s <sup>2</sup>

Tab. 5: Transport and storage conditions

Operating conditions	
Surrounding temperature during operation	0 °C to 45 °C for nominal data 45 °C to 55 °C with -2.5%/°C derating
Relative humidity	Maximum relative humidity 85%, non-condensing
Installation altitude	0 m to 1000 m above sea level without restrictions 1000 m to 2000 m above sea level with -1.5%/100 m derating
Pollution degree	Pollution degree level 2 in accordance with EN 50178
Ventilation	Installed fan
Vibration (operation) in accordance with DIN EN 60068-2-6	5 Hz ≤ f ≤ 9 Hz: 0.35 mm 9 Hz ≤ f ≤ 200 Hz: 1 m/s <sup>2</sup>

Tab. 6: Operating conditions

Discharge times	
Self-discharge	5 min.

Tab. 7: Discharge times of the DC link circuit



## 5.2.5 Electrical data

The electrical data of the available sizes as well as the properties of the brake chopper can be found in the following sections.

SDS

### 5.2.5.1 Size 0: SDS 5007A to SDS 5015A

Electrical data	SDS 5007A	SDS 5008A	SDS 5015A
ID No.	55428	55429	55430
Recommended motor rating	0.75 kW	0.75 kW	1.5 kW
$U_{1PU}$	1 × 230 V, +20% / -40%, 50/60 Hz	3 × 400 V, +32% / -50%, 50 Hz; 3 × 480 V, +10% / -58%, 60 Hz	
$I_{1N,PU}$	1 × 5.9 A	3 × 2.2 A	3 × 4 A
$f_{2PU}$	0 – 700 Hz		
$U_{2PU}$	0 – 230 V	0 – 400 V	
$U_{maxPU}$	440 V	830 V	

Tab. 8: SDS 5000 electrical data, size 0

#### Nominal currents up to +45 °C (in the control cabinet)

#### Operation with asynchronous motor

Electrical data	SDS 5007A	SDS 5008A	SDS 5015A
$I_{2N,PU}$	3 × 4 A	3 × 2.3 A	3 × 4.5 A
$I_{2maxPU}$	180% for 5 s; 150% for 30 s		
$f_{PWM,PU}$	4 kHz <sup>1</sup>		

Tab. 9: SDS 5000 electrical data, size 0, for 4 kHz clock frequency

#### Operation with synchronous servo motor

Electrical data	SDS 5007A	SDS 5008A	SDS 5015A
$I_{2N,PU}$	3 × 3 A	3 × 1.7 A	3 × 3.4 A
$I_{2maxPU}$	250% for 2 s; 200% for 5 s		
$f_{PWM,PU}$	8 kHz <sup>2</sup>		

Tab. 10: SDS 5000 electrical data, size 0, for 8 kHz clock frequency

Electrical data	SDS 5007A	SDS 5008A	SDS 5015A
$U_{onCH}$	400 – 420 V	780 – 800 V	
$U_{offCH}$	360 – 380 V	740 – 760 V	
$R_{2minRB}$	100 Ω	100 Ω	
$P_{maxRB}$	1.8 kW	6.4 kW	

Tab. 11: Brake chopper electrical data, size 0

<sup>1</sup> Clock frequency adjustable from 4 to 16 kHz (see the chapter on derating)

<sup>2</sup> Clock frequency adjustable from 4 to 16 kHz (see the chapter on derating)



### 5.2.5.2 Size 1: SDS 5040A to SDS 5075A

Electrical data	SDS 5040A	SDS 5075A
ID No.	55431	55432
Recommended motor rating	4.0 kW	7.5 kW
$U_{1PU}$	3 × 400 V, +32% / -50%, 50 Hz; 3 × 480 V, +10% / -58%, 60 Hz	
$I_{1N,PU}$	3 × 9.3 A	3 × 15.8 A
$f_{2PU}$	0 – 700 Hz	
$U_{2PU}$	0 – 400 V	
$U_{maxPU}$	830 V	

Tab. 12: SDS 5000 electrical data, size 1

#### Nominal currents up to +45 °C (in the control cabinet)

#### Operation with asynchronous motor

Electrical data	SDS 5040A	SDS 5075A
$I_{2N,PU}$	3 × 10 A	3 × 16 A
$I_{2maxPU}$	180% for 5 s; 150% for 30 s	
$f_{PWM,PU}$	4 kHz <sup>3</sup>	

Tab. 13: SDS 5000 electrical data, size 1, for 4 kHz clock frequency

#### Operation with synchronous servo motor

Electrical data	SDS 5040A	SDS 5075A
$I_{2N,PU}$	3 × 6 A	3 × 10 A
$I_{2maxPU}$	250% for 2 s; 200% for 5 s	
$f_{PWM,PU}$	8 kHz <sup>4</sup>	

Tab. 14: SDS 5000 electrical data, size 1, for 8 kHz clock frequency

Electrical data	SDS 5040A	SDS 5075A
$U_{maxPU}$	830 V	
$U_{onCH}$	780 – 800 V	
$U_{offCH}$	740 – 760 V	
$R_{2minRB}$	47 Ω	47 Ω
$P_{maxRB}$	13.6 kW	13.6 kW

Tab. 15: Brake chopper electrical data, size 1

<sup>3</sup> Clock frequency adjustable from 4 to 16 kHz (see the chapter on derating)

<sup>4</sup> Clock frequency adjustable from 4 to 16 kHz (see the chapter on derating)



### 5.2.5.3 Size 2: SDS 5110A to SDS 5150A

SDS

Electrical data	SDS 5110A	SDS 5150A
ID No.	55433	55434
Recommended motor rating	11 kW	15 kW
$U_{1PU}$	3 × 400 V, +32% / -50%, 50 Hz; 3 × 480 V, +10% / -58%, 60 Hz	
$I_{1N,PU}$	3 × 24.5 A	3 × 32.6 A
$f_{2PU}$	0 – 700 Hz	
$U_{2PU}$	0 – 400 V	
$U_{maxPU}$	830 V	

Tab. 16: SDS 5000 electrical data, size 2

**Nominal currents up to +45 °C (in the control cabinet)**

**Operation with asynchronous motor**

Electrical data	SDS 5110A	SDS 5150A
$I_{2N,PU}$	3 × 22 A	3 × 32 A
$I_{2maxPU}$	180% for 5 s; 150% for 30 s	
$f_{PWM,PU}$	4 kHz <sup>5</sup>	

Tab. 17: SDS 5000 electrical data, size 2, for 4 kHz clock frequency

**Operation with synchronous servo motor**

Electrical data	SDS 5110A	SDS 5150A
$I_{2N,PU}$	3 × 14 A	3 × 20 A
$I_{2maxPU}$	250% for 2 s; 200% for 5 s	
$f_{PWM,PU}$	8 kHz <sup>6</sup>	

Tab. 18: SDS 5000 electrical data, size 2, for 8 kHz clock frequency

Electrical data	SDS 5110A	SDS 5150A
$U_{onCH}$	780 – 800 V	
$U_{offCH}$	740 – 760 V	
$R_{2minRB}$	22 Ω	
$P_{maxRB}$	29.1 kW	

Tab. 19: Brake chopper electrical data, size 2

<sup>5</sup> Clock frequency adjustable from 4 to 16 kHz (see the chapter on derating)

<sup>6</sup> Clock frequency adjustable from 4 to 16 kHz (see the chapter on derating)



### 5.2.5.4 Size 3: SDS 5220A to SDS 5450A

Electrical data	SDS 5220A	SDS 5370A	SDS 5450A
ID No.	55435	55436	55437
Recommended motor rating	22 kW	37 kW	45 kW
$U_{1PU}$	3 × 400 V, +32% / -50%, 50 Hz; 3 × 480 V, +10% / -58%, 60 Hz		
$I_{1N,PU}$	1 × 37 A	3 × 62 A	3 × 76 A
$f_{2PU}$	0 – 700 Hz		
$U_{2PU}$	0 – 400 V		
$U_{maxPU}$	830 V		

Tab. 20: SDS 5000 electrical data, size 3

#### Nominal currents up to +45 °C (in the control cabinet)

#### Operation with asynchronous motor

Electrical data	SDS 5220A	SDS 5370A	SDS 5450A
$I_{2N,PU}$	3 × 44 A	3 × 70 A	3 × 85 A
$I_{2maxPU}$	180% for 5 s; 150% for 30 s		
$f_{PWM,PU}$	4 kHz <sup>7</sup>		

Tab. 21: SDS 5000 electrical data, size 3, for 4 kHz clock frequency

#### Operation with synchronous servo motor

Electrical data	SDS 5220A	SDS 5370A	SDS 5450A
$I_{2N,PU}$	3 × 30 A	3 × 50 A	3 × 60 A
$I_{2maxPU}$	250% for 2 s; 200% for 5 s		
$f_{PWM,PU}$	8 kHz <sup>8</sup>		

Tab. 22: SDS 5000 electrical data, size 3, for 8 kHz clock frequency

Electrical data	SDS 5220A	SDS 5370A	SDS 5450A
$U_{onCH}$	780 – 800 V		
$U_{offCH}$	740 – 760 V		
$R_{intRB}$	30 Ω (PTC resistance; 100 W; max. 1 kW for 1 s; $\tau = 40$ s)		
$R_{2minRB}$	15 Ω		
$P_{maxRB}$	42 kW		

Tab. 23: Brake chopper electrical data, size 3

<sup>7</sup> Clock frequency adjustable from 4 to 16 kHz (see the chapter on derating)

<sup>8</sup> Clock frequency adjustable from 4 to 16 kHz (see the chapter on derating)



5.2.5.5 Power loss data in accordance with EN 50598

SDS

Type	Nominal current $I_{2N,PU}$	Appar-ent power	Absolute losses $P_{V,CU}^9$	Working points <sup>10</sup>								IE class <sup>11</sup>
				(0/25)	(0/50)	(0/100)	(50/25)	(50/50)	(50/100)	(90/50)	(90/100)	
				Relative losses								
	[A]	[kVA]	[W]	[%]								
SDS 5007A	4	0.9	10	5.01	5.07	5.68	5.20	5.37	6.30	5.88	7.43	IE2
SDS 5008A	2.3	1.6	10	2.98	3.13	3.49	3.02	3.22	3.71	3.36	4.09	IE2
SDS 5015A	4.5	3.1	12	1.71	1.86	2.24	1.75	1.97	2.51	2.16	3.04	IE2
SDS 5040A	10	6.9	12	1.38	1.54	1.93	1.43	1.64	2.17	1.80	2.57	IE2
SDS 5075A	16	11.1	12	0.95	1.12	1.66	0.99	1.23	1.98	1.41	2.52	IE2
SDS 5110A	22	15.2	15	0.80	0.97	1.49	0.84	1.06	1.75	1.21	2.19	IE2
SDS 5150A	32	22.2	15	0.70	0.87	1.40	0.74	0.97	1.66	1.11	2.08	IE2
SDS 5220A	44	30.5	35	0.61	0.76	1.21	0.68	0.90	1.53	1.06	1.96	IE2
SDS 5370A	70	48.5	35	0.53	0.69	1.18	0.59	0.82	1.49	0.97	1.89	IE2
SDS 5450A	85	58.9	35	0.47	0.64	1.18	0.54	0.78	1.50	0.94	1.94	IE2

Tab. 24: Relative losses of inverter SDS 5000 according to EN 50598

<sup>9</sup> Absolute losses for a power unit that is switched off

<sup>10</sup> Operating points for relative motor stator frequency in % and relative torque current in %

<sup>11</sup> IE class in accordance with EN 50598



Type	Nominal current $I_{2N,PU}$	Apparent power	Absolute losses $P_{V,CU}^{12}$	Working points <sup>13</sup>								IE class <sup>14</sup>	Comparison <sup>15</sup>
				(0/25)	(0/50)	(0/100)	(50/25)	(50/50)	(50/100)	(90/50)	(90/100)		
				[A]	[kVA]	[W]	Absolute losses $P_V$						
SDS 5007A	4	0.9	10	45.1	45.6	51.1	46.8	48.3	56.7	52.9	66.9	IE2	51.8
SDS 5008A	2.3	1.6	10	47.7	50.1	55.8	48.3	51.5	59.3	53.8	65.4	IE2	40.2
SDS 5015A	4.5	3.1	12	52.9	57.6	69.3	54.4	61.0	77.9	67.1	94.1	IE2	39.6
SDS 5040A	10	6.9	12	95.3	106.1	133.3	98.6	113.2	149.9	123.9	177.0	IE2	37.1
SDS 5075A	16	11.1	12	104.9	124.0	184.6	110.3	136.6	219.8	156.0	279.8	IE2	35.8
SDS 5110A	22	15.2	15	121.5	146.9	226.1	128.1	161.6	266.0	183.7	332.7	IE2	32.9
SDS 5150A	32	22.2	15	154.7	192.8	311.3	164.6	214.6	369.3	245.9	462.1	IE2	38.3
SDS 5220A	44	30.5	35	187.5	232.2	368.7	207.7	273.9	466.8	323.0	597.8	IE2	32.1
SDS 5370A	70	48.5	35	256.6	332.3	570.8	287.9	397.0	721.5	471.0	915.9	IE2	33.9
SDS 5450A	85	58.9	35	277.8	376.9	692.3	317.4	459.0	886.1	554.6	1143.1	IE2	35.3

Tab. 25: Power loss data of SDS 5000 inverter in accordance with EN 50598

#### General conditions

The loss data applies to inverters without accessories.

The power loss calculation is based on a three-phase supply voltage with 400 V<sub>AC</sub> / 50 Hz.

The calculated data includes a supplement of 10% in accordance with EN 50598.

The power loss specifications refer to a clock frequency of 4 kHz.

The absolute losses for a power unit that is switched off refer to the 24 V<sub>DC</sub> power supply of the control electronics.

<sup>12</sup> Absolute losses for a power unit that is switched off

<sup>13</sup> Operating points for relative motor stator frequency in % and relative torque current in %

<sup>14</sup> IE class in accordance with EN 50598

<sup>15</sup> Comparison of the losses for the reference inverter related to IE2 in the nominal point (90, 100)





### 5.2.5.6 Power loss data of accessories

SDS

Type	Absolute losses $P_v$ [W]
ASP 5001 safety module	1
SEA 5001 terminal module	< 2
XEA 5001 terminal module	< 5
REA 5001 terminal module	< 5
CAN 5000 fieldbus module	1
DP 5000 fieldbus module	< 2
ECS 5000 fieldbus module	< 2
PN 5000 fieldbus module	< 4
BRM 5000 / BRS 5001 brake module	< 1

Tab. 26: Absolute losses of the accessories

#### Information

Note the absolute power loss of the encoder (usually < 3 W) and of the brake when designing as well.

### 5.2.6 Derating by increasing the clock frequency

Depending on the clock frequency  $f_{PWM,PU}$ , the following values for nominal output currents  $I_{2N,PU}$  arise. Note that only 8 kHz and 16 kHz can be set for the servo control type.

Type	$I_{2N,PU}$ 4 kHz	$I_{2N,PU}$ 8 kHz	$I_{2N,PU}$ 16 kHz
SDS 5007A	4 A	3 A	2 A
SDS 5008A	2.3 A	1.7 A	1.2 A
SDS 5015A	4.5 A	3.4 A	2.2 A
SDS 5040A	10 A	6 A	3.3 A
SDS 5075A	16 A	10 A	5.7 A
SDS 5110A	22 A	14 A	8.1 A
SDS 5150A	32 A	20 A	11.4 A
SDS 5220A	44 A	30 A	18.3 A
SDS 5370A	70 A	50 A	31.8 A
SDS 5450A	85 A	60 A	37.8 A

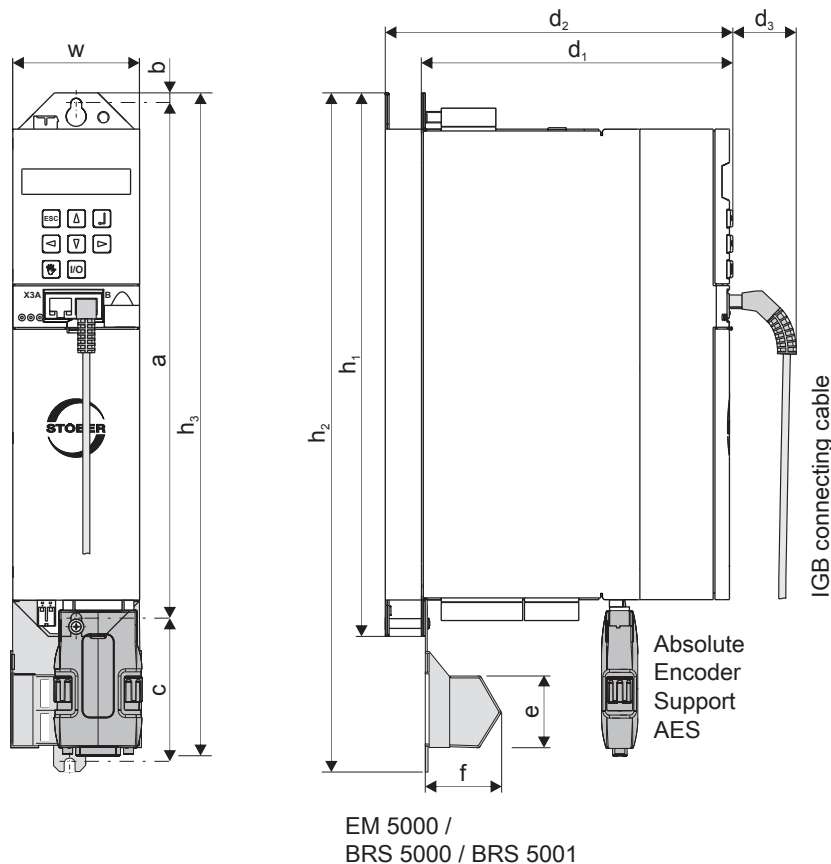
Tab. 27: Nominal output current  $I_{2N,PU}$  dependent on the clock frequency



## 5.2.7 Dimensions

The dimensions of the available SDS 5000 sizes can be found in the following chapters.

### 5.2.7.1 Dimensions: sizes 0 to 2



Dimensions [mm]		Size 0	Size 1	Size 2	
Inverter	Height	$h_1$	300		
		$h_2$	360 <sup>16</sup> / 373 <sup>17</sup>		
		$h_3$ <sup>18</sup>	365		
	Width	w	70	105	
	Depth	$d_1$	175	260	260
		$d_2$ <sup>19</sup>	193	278	278
$d_3$		40			
EMC shroud	Height	e	37.5 <sup>20</sup> / 44 <sup>21</sup>		
	Depth	f	40		
Fastening holes	Vertical distance to the upper edge	b	6		
	Vertical distance	a	283+2		
	Vertical distance	$c$ <sup>22</sup>	79		

<sup>16</sup>  $h_2$  = height incl. EMC shroud EM 5000

<sup>17</sup>  $h_2$  = height incl. brake module BRS 5001

<sup>18</sup>  $h_3$  = Height incl. AES

<sup>19</sup>  $d_2$  = Depth including RB 5000 brake resistor

<sup>20</sup> e = height of EM 5000 EMC shroud

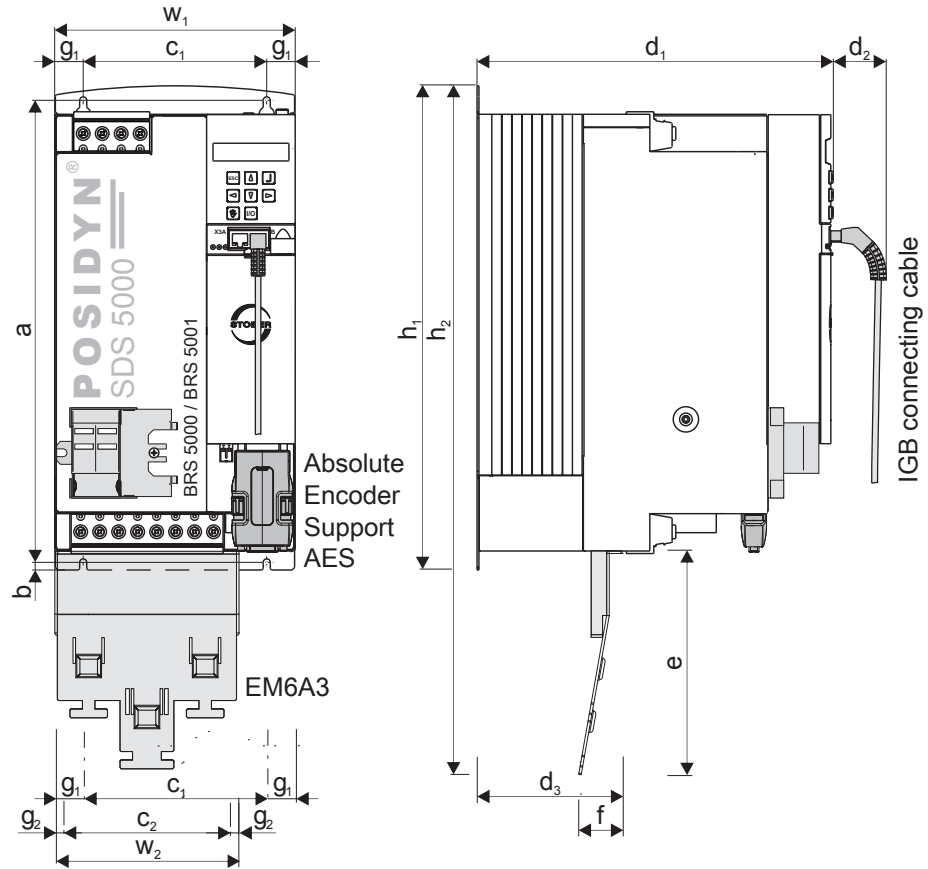
<sup>21</sup> e = height of BRS 5001 brake module

<sup>22</sup> c = vertical distance with BRS 5001 brake module



5.2.7.2 Dimensions: size 3

SDS



Dimensions [mm]		Size 3	
Inverter	Height	$h_1$	382.5
		$h_2^{23}$	540
	Width	$w_1$	194
	Depth	$d_1$	276
$d_2$		40	
EMC shroud	Height	$e$	174
	Width	$w_2$	147
	Depth	$f$	34
	Depth	$d_3$	113
Fastening holes	Vertical distance	$a$	365+2
	Vertical distance to the bottom edge	$b$	6
	Horizontal distance	$c_1^{24}$	150+0.2/-0.2
	Horizontal distance to the side edge	$g_1^{25}$	20
	Horizontal distance	$c_2^{26}$	132
	Horizontal distance to the side edge	$g_2^{27}$	7.5

<sup>23</sup>  $h_2$  = Height incl. EM6A3 EMC shroud

<sup>24</sup>  $c_1$  = Horizontal distance to the fastening holes of the inverter

<sup>25</sup>  $g_1$  = Horizontal distance to the side edge of the inverter

<sup>26</sup>  $c_2$  = Horizontal distance to the fastening holes of the EM6A3 EMC shroud

<sup>27</sup>  $g_2$  = Horizontal distance to the side edge of the EM6A3 EMC shroud



## 5.2.8 Minimum clearances

The specified dimensions refer to the outside edges of the inverter.

Minimum clearance	Above	Below	On the side
Size 0 – Size 2	100	100	5
... with EMC shroud or brake module	100	120	5
Size 3	100	100	5
... with EMC shroud	100	220	5

Tab. 28: Minimum clearances [mm]



### 5.3 Inverter/motor combination

SDS

#### EZ synchronous servo motor ( $n_N = 2000$ rpm) – SDS/MDS 5000

						5007A	5008A	5015A	5040A	5075A	5110A	5150A	5220A	5370A	5450A
$K_{EM}$ [V/1000 rpm]	$M_N$ [Nm]	$I_{N,MOT}$ [A]	$M_0$ [Nm]	$I_0$ [A]	$I_{2N,PU}^=$ 3 A	$I_{2N,PU}^=$ 1.7 A	$I_{2N,PU}^=$ 3.4 A	$I_{2N,PU}^=$ 6 A	$I_{2N,PU}^=$ 10 A	$I_{2N,PU}^=$ 14 A	$I_{2N,PU}^=$ 20 A	$I_{2N,PU}^=$ 30 A	$I_{2N,PU}^=$ 50 A	$I_{2N,PU}^=$ 60 A	

#### IC 410 convection cooling

					$I_{2N,PU} / I_0$											
EZ805U	142	43.7	25.9	66.1	37.9										1.3	1.6

#### IC 416 forced ventilation

					$I_{2N,PU} / I_0$											
EZ805B	142	77.2	45.2	94	53.9											1.1

#### EZ synchronous servo motor ( $n_N = 3000$ rpm) – SDS/MDS 5000

						5007A	5008A	5015A	5040A	5075A	5110A	5150A	5220A	5370A	5450A
$K_{EM}$ [V/1000 rpm]	$M_N$ [Nm]	$I_{N,MOT}$ [A]	$M_0$ [Nm]	$I_0$ [A]	$I_{2N,PU}^=$ 3 A	$I_{2N,PU}^=$ 1.7 A	$I_{2N,PU}^=$ 3.4 A	$I_{2N,PU}^=$ 6 A	$I_{2N,PU}^=$ 10 A	$I_{2N,PU}^=$ 14 A	$I_{2N,PU}^=$ 20 A	$I_{2N,PU}^=$ 30 A	$I_{2N,PU}^=$ 50 A	$I_{2N,PU}^=$ 60 A	

#### IC 410 convection cooling

					$I_{2N,PU} / I_0$												
EZ301U	40	0.93	1.99	0.95	2.02	1.5											
EZ302U	86	1.59	1.6	1.68	1.67		1.0	2.0									
EZ303U	109	2.07	1.63	2.19	1.71		1.0	2.0									
EZ401U	96	2.8	2.74	3	2.88			1.2									
EZ402U	94	4.7	4.4	5.2	4.8				1.3								
EZ404U	116	6.9	5.8	8.6	6.6					1.5							
EZ501U	97	4.3	3.74	4.7	4				1.5								
EZ502U	121	7.4	5.46	8	5.76				1.0	1.7							
EZ503U	119	9.7	6.9	11.1	7.67					1.3	1.8						
EZ505U	141	13.5	8.8	16	10					1.0	1.4	2.0					
EZ701U	95	7.4	7.2	8.3	8					1.3	1.8						
EZ702U	133	12	8.2	14.4	9.6					1.0	1.5						
EZ703U	122	16.5	11.4	20.8	14						1.0	1.4					
EZ705U	140	21.3	14.2	30.2	19.5							1.0	1.5				
EZ802U	136	22.3	13.9	37.1	22.3								1.3				
EZ803U	131	26.6	17.7	48.2	31.1									1.6	1.9		

#### IC 416 forced ventilation

					$I_{2N,PU} / I_0$												
EZ401B	96	3.4	3.4	3.7	3.6				1.7								
EZ402B	94	5.9	5.5	6.3	5.8				1.0	1.7							
EZ404B	116	10.2	8.2	11.2	8.7					1.1	1.6						
EZ501B	97	5.4	4.7	5.8	5				1.2	2.0							
EZ502B	121	10.3	7.8	11.2	8.16					1.2	1.7						
EZ503B	119	14.4	10.9	15.9	11.8						1.2	1.7					
EZ505B	141	20.2	13.7	23.4	14.7						1.0	1.4					
EZ701B	95	9.7	9.5	10.5	10					1.0	1.4	2.0					
EZ702B	133	16.6	11.8	19.3	12.9						1.1	1.6					
EZ703B	122	24	18.2	28	20							1.0	1.5				
EZ705B	140	33.8	22.9	41.8	26.5								1.1	1.9			
EZ802B	136	34.3	26.5	47.9	28.9								1.0	1.7			
EZ803B	131	49	35.9	66.7	42.3									1.2	1.4		



## 5 POSIDYN SDS 5000 inverters

### 5.3 Inverter/motor combination



#### EZ synchronous servo motor ( $n_N = 4500$ rpm) – SDS/MDS 5000

						5007A	5008A	5015A	5040A	5075A	5110A	5150A	5220A	5370A	5450A
$K_{EM}$	$M_N$	$I_{N,MOT}$	$M_0$	$I_0$		$I_{2N,PU}$	$I_{2N,PU}$	$I_{2N,PU}$	$I_{2N,PU}$	$I_{2N,PU}$	$I_{2N,PU}$	$I_{2N,PU}$	$I_{2N,PU}$	$I_{2N,PU}$	$I_{2N,PU}$
[V/1000 rpm]	[Nm]	[A]	[Nm]	[A]		3 A	1.7 A	3.4 A	6 A	10 A	14 A	20 A	30 A	50 A	60 A

#### IC 410 convection cooling

						$I_{2N,PU} / I_0$										
EZ505U	103	9.5	8.94	15.3	13.4						1.0	1.5				
EZ703U	99	12.1	11.5	20	17.8							1.1	1.7			
EZ705U	106	16.4	14.8	30	25.2								1.2	2.0		
EZ802U	90	10.5	11.2	34.5	33.3									1.5	1.8	

#### IC 416 forced ventilation

						$I_{2N,PU} / I_0$										
EZ505B	103	16.4	16.4	22	19.4							1.0	1.5			
EZ703B	99	19.8	20.3	27.2	24.2								1.2			
EZ705B	106	27.7	25.4	39.4	32.8									1.5	1.8	
EZ802B	90	30.6	30.5	47.4	45.1									1.1	1.3	

#### EZ synchronous servo motor ( $n_N = 6000$ rpm) – SDS/MDS 5000

						5007A	5008A	5015A	5040A	5075A	5110A	5150A	5220A	5370A	5450A
$K_{EM}$	$M_N$	$I_{N,MOT}$	$M_0$	$I_0$		$I_{2N,PU}$	$I_{2N,PU}$	$I_{2N,PU}$	$I_{2N,PU}$	$I_{2N,PU}$	$I_{2N,PU}$	$I_{2N,PU}$	$I_{2N,PU}$	$I_{2N,PU}$	$I_{2N,PU}$
[V/1000 rpm]	[Nm]	[A]	[Nm]	[A]		3 A	1.7 A	3.4 A	6 A	10 A	14 A	20 A	30 A	50 A	60 A

#### IC 410 convection cooling

						$I_{2N,PU} / I_0$										
EZ301U	40	0.89	1.93	0.95	2.02			1.7								
EZ302U	42	1.5	3.18	1.68	3.48				1.7							
EZ303U	55	1.96	3.17	2.25	3.55				1.7							
EZ401U	47	2.3	4.56	2.8	5.36				1.1	1.9						
EZ402U	60	3.5	5.65	4.9	7.43					1.3	1.9					
EZ404U	78	5.8	7.18	8.4	9.78					1.0	1.4	2.0				
EZ501U	68	3.4	4.77	4.4	5.8				1.0	1.7	2.4					
EZ502U	72	5.2	7.35	7.8	9.8					1.0	1.4	2.0				
EZ503U	84	6.2	7.64	10.6	11.6						1.2	1.7				
EZ701U	76	5.2	6.68	7.9	9.38					1.1	1.5					
EZ702U	82	7.2	8.96	14.3	16.5							1.2	1.8			

#### IC 416 forced ventilation

						$I_{2N,PU} / I_0$										
EZ401B	47	2.9	5.62	3.5	6.83					1.5	2.0					
EZ402B	60	5.1	7.88	6.4	9.34					1.1	1.5					
EZ404B	78	8	9.98	10.5	12						1.2	1.7				
EZ501B	68	4.5	6.7	5.7	7.5					1.3	1.9					
EZ502B	72	8.2	11.4	10.5	13.4						1.0	1.5				
EZ503B	84	10.4	13.5	14.8	15.9							1.3	1.9			
EZ701B	76	7.5	10.6	10.2	12.4						1.1	1.6				
EZ702B	82	12.5	16.7	19.3	22.1								1.4			

#### EZHD synchronous servo motor with hollow shaft and direct drive ( $n_N = 3000$ rpm) – SDS/MDS 5000

						5007A	5008A	5015A	5040A	5075A	5110A	5150A	5220A	5370A	5450A
$K_{EM}$	$M_N$	$I_{N,MOT}$	$M_0$	$I_0$		$I_{2N,PU}$	$I_{2N,PU}$	$I_{2N,PU}$	$I_{2N,PU}$	$I_{2N,PU}$	$I_{2N,PU}$	$I_{2N,PU}$	$I_{2N,PU}$	$I_{2N,PU}$	$I_{2N,PU}$
[V/1000 rpm]	[Nm]	[A]	[Nm]	[A]		3 A	1.7 A	3.4 A	6 A	10 A	14 A	20 A	30 A	50 A	60 A

#### IC 410 convection cooling

						$I_{2N,PU} / I_0$										
EZHD0411U	96	1.9	2.36	2.6	2.89	1.0		1.2								
EZHD0412U	94	4.2	4.29	5.1	4.94				1.2							
EZHD0414U	116	7.7	6.3	8.5	6.88					1.5						
EZHD0511U	97	3	3.32	4.1	4.06				1.5							
EZHD0512U	121	7.0	5.59	7.8	6.13					1.6						
EZHD0513U	119	8.3	7.04	10.9	8.76					1.1	1.6					
EZHD0515U	141	14	9.46	16.4	11						1.3	1.8				
EZHD0711U	95	7.3	7.53	7.9	7.98					1.3	1.8					
EZHD0712U	133	11.6	8.18	14.4	9.99					1.0	1.4					
EZHD0713U	122	17.8	13.4	20.4	15.1							1.3	2.0			
EZHD0715U	140	24.6	17.2	31.1	21.1								1.4			



**EZHP synchronous servo motor with hollow shaft and attached planetary gear unit ( $n_N = 3000$  rpm) – SDS/MDS 5000**

						5007A	5008A	5015A	5040A	5075A	5110A	5150A	5220A	5370A	5450A
$K_{EM}$ [V/1000 rpm]	$M_N$ [Nm]	$I_{N,MOT}$ [A]	$M_0$ [Nm]	$I_0$ [A]	$I_{2N,PU}^=$ 3 A	$I_{2N,PU}^=$ 1.7 A	$I_{2N,PU}^=$ 3.4 A	$I_{2N,PU}^=$ 6 A	$I_{2N,PU}^=$ 10 A	$I_{2N,PU}^=$ 14 A	$I_{2N,PU}^=$ 20 A	$I_{2N,PU}^=$ 30 A	$I_{2N,PU}^=$ 50 A	$I_{2N,PU}^=$ 60 A	

**IC 410 convection cooling**

										$I_{2N,PU} / I_0$						
EZHP_511U	97	3	3.32	4.1	4.06				1.5							
EZHP_512U	121	7.0	5.59	7.8	6.13					1.6						
EZHP_513U	119	8.3	7.04	10.9	8.76					1.1	1.6					
EZHP_515U	141	14	9.46	16.4	11						1.3	1.8				
EZHP_711U	95	7.3	7.53	7.9	7.98					1.3	1.8					
EZHP_712U	133	11.6	8.18	14.4	9.99					1.0	1.4					
EZHP_713U	122	17.8	13.4	20.4	15.1							1.3	2.0			
EZHP_715U	140	24.6	17.2	31.1	21.1								1.4			

**EZS synchronous servo motor for screw drive (driven threaded spindle) ( $n_N = 3000$  rpm) – SDS/MDS 5000**

						5007A	5008A	5015A	5040A	5075A	5110A	5150A	5220A	5370A	5450A
$K_{EM}$ [V/1000 rpm]	$M_N$ [Nm]	$I_{N,MOT}$ [A]	$M_0$ [Nm]	$I_0$ [A]	$I_{2N,PU}^=$ 3 A	$I_{2N,PU}^=$ 1.7 A	$I_{2N,PU}^=$ 3.4 A	$I_{2N,PU}^=$ 6 A	$I_{2N,PU}^=$ 10 A	$I_{2N,PU}^=$ 14 A	$I_{2N,PU}^=$ 20 A	$I_{2N,PU}^=$ 30 A	$I_{2N,PU}^=$ 50 A	$I_{2N,PU}^=$ 60 A	

**IC 410 convection cooling**

										$I_{2N,PU} / I_0$						
EZS501U	97	3.85	3.65	4.3	3.95				1.5							
EZS502U	121	6.9	5.3	7.55	5.7				1.1	1.8						
EZS503U	119	9.1	6.7	10.7	7.6					1.3	1.8					
EZS701U	95	6.65	6.8	7.65	7.7					1.3	1.8					
EZS702U	133	11	7.75	13.5	9.25					1.1	1.5					
EZS703U	122	15.3	10.8	19.7	13.5						1.0	1.5				

**IC 416 forced ventilation**

										$I_{2N,PU} / I_0$						
EZS501B	97	5.1	4.7	5.45	5				1.2	2.0						
EZS502B	121	10	7.8	10.9	8.16					1.2	1.7					
EZS503B	119	14.1	10.9	15.6	11.8						1.2	1.7				
EZS701B	95	9.35	9.5	10.2	10					1.0	1.4	2.0				
EZS702B	133	16.3	11.8	19	12.9						1.1	1.6				
EZS703B	122	23.7	18.2	27.7	20							1.0	1.5			

**EZM synchronous servo motor for screw drive (driven threaded nut) ( $n_N = 3000$  rpm) – SDS/MDS 5000**

						5007A	5008A	5015A	5040A	5075A	5110A	5150A	5220A	5370A	5450A
$K_{EM}$ [V/1000 rpm]	$M_N$ [Nm]	$I_{N,MOT}$ [A]	$M_0$ [Nm]	$I_0$ [A]	$I_{2N,PU}^=$ 3 A	$I_{2N,PU}^=$ 1.7 A	$I_{2N,PU}^=$ 3.4 A	$I_{2N,PU}^=$ 6 A	$I_{2N,PU}^=$ 10 A	$I_{2N,PU}^=$ 14 A	$I_{2N,PU}^=$ 20 A	$I_{2N,PU}^=$ 30 A	$I_{2N,PU}^=$ 50 A	$I_{2N,PU}^=$ 60 A	

**IC 410 convection cooling**

										$I_{2N,PU} / I_0$						
EZM511U	97	3.65	3.55	4.25	4				1.5							
EZM512U	121	6.6	5.2	7.55	5.75				1.0	1.7						
EZM513U	119	8.8	6.55	10.6	7.6					1.3	1.8					
EZM711U	95	6.35	6.6	7.3	7.4					1.4	1.9					
EZM712U	133	10.6	7.5	13	8.9					1.1	1.6					
EZM713U	122	14.7	10.4	18.9	13						1.1	1.5				



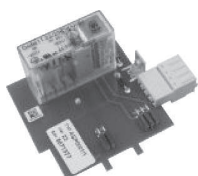
## 5.4 Accessories

You can find information about the available accessories in the following chapters.

### 5.4.1 Safety technology

#### ASP 5001 – Safe Torque Off

Available with the standard version.



Option module for implementation of integrated Safe Torque Off (STO) safety function.

The ASP 5001 may only be installed by STÖBER ANTRIEB-STECHNIK GmbH & Co. KG.

The ASP 5001 has to be ordered with the base unit.

### 5.4.2 Communication

#### IGB connecting cable



Cable for connecting the interface X3A or X3B on the inverter front for IGB, CAT5e, magenta, connector angled at 45°.

The following versions are available:

ID No. 49855: 0.4 m.

ID No. 49856: 2 m.

#### PC connecting cable



ID No. 49857

Cable for connecting the X3A or X3B interface with the PC, CAT5e, blue, 5 m.

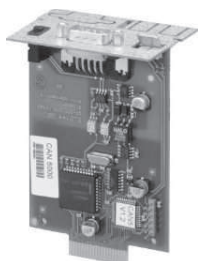
#### Hi-speed USB 2.0 Ethernet adapter



ID No. 49940

Adapter for connecting Ethernet to a USB port.

#### CANopen DS-301 CAN 5000 communication module



ID No. 44574

Accessory part for connecting CAN bus.



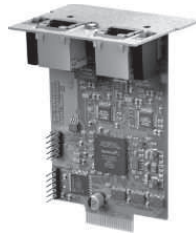


**PROFIBUS DP-V1 DP 5000 communication module**



ID No. 44575  
Accessory module for connecting PROFIBUS DP-V1.

**EtherCAT ECS 5000 communication module**



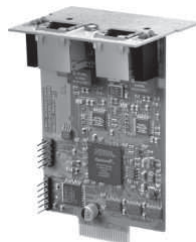
ID No. 49014  
Accessory part for connecting EtherCAT (CANopen over EtherCAT).

**EtherCAT cables**



Ethernet patch cable, CAT5e, yellow.  
The following versions are available:  
ID No. 49313: Length approx. 0.2 m.  
ID No. 49314: length approx. 0.35 m.

**PROFINET PN 5000 communication module**



ID No. 53893  
Accessory part for connecting PROFINET.

**5.4.3 Terminal module**

**SEA 5001 standard terminal module**



ID No. 49576  
Terminals:  
• 2 analog inputs  
• 2 analog outputs  
• 5 binary inputs  
• 2 binary outputs



### XEA 5001 extended terminal module



ID No. 49015

Terminals:

- 3 analog inputs
- 2 analog outputs
- 13 binary inputs
- 10 binary outputs

Encoder / interfaces:

- TTL incremental encoder (simulation and evaluation)
- Pulse train (simulation and evaluation)
- SSI encoder (simulation and evaluation)

### X120 SSI/TTL connection cable



ID No. 49482

Cable for connecting the X120 TTL interface on the SD6 drive controller (on terminal module RI6 or XI6) with the X301 interface on the LA6 adapter box in order to transfer Hall sensor signals. 0.3 m.

### REA 5001 resolver terminal module



ID No. 49854

Terminals:

- 2 analog inputs
- 2 analog outputs
- 5 binary inputs
- 2 binary outputs

Encoder / interfaces:

- Resolver
- Encoder EnDat 2.1 sin/cos
- TTL incremental encoder (simulation and evaluation)
- SSI encoder (simulation and evaluation)
- Pulse train (simulation and evaluation)



Resolver cables that were connected to an POSIDYN SDS 4000 can be connected using the resolver adapter (9-pin to 15-pin) included in the scope of delivery to terminal X140 of REA 5001.



## 5.4.4 Braking resistor

In addition to the inverters, STOBBER offers braking resistors in different sizes and performance classes described below. For the selection, note the minimum permitted braking resistances specified in the technical data of the individual inverter types.

SDS

### 5.4.4.1 FZMU, FZZMU 400×65 tubular fixed resistor

Type	FZMU 400×65			FZZMU 400×65		
	49010	55445	55446	53895	55447	55448
SDS 5007A	X	—	—	—	—	—
SDS 5008A	X	—	—	—	—	—
SDS 5015A	X	—	—	—	—	—
SDS 5040A	—	—	—	X	—	—
SDS 5075A	—	—	—	X	—	—
SDS 5110A	—	X	—	—	X	—
SDS 5150A	—	X	—	—	X	—
SDS 5220A	—	—	X	—	—	X
SDS 5370A	—	—	X	—	—	X
SDS 5450A	—	—	X	—	—	X

Tab. 29: Assignment of FZMU, FZZMU 400×65 braking resistor – SDS 5000 inverters

#### Properties

Specification	FZMU 400×65			FZZMU 400×65		
	49010	55445	55446	53895	55447	55448
ID No.	49010	55445	55446	53895	55447	55448
Type	Tubular fixed resistor			Tubular fixed resistor		
Resistance [Ω]	100	22	15	47	22	15
Power [W]	600			1200		
Therm. time const. $\tau_{th}$ [s]	40			40		
Pulse power for < 1 s [kW]	18			36		
$U_{max}$ [V]	848			848		
Weight [kg]	Approx. 2.2			Approx. 4.2		
Protection class	IP20			IP20		
Test marks						

Tab. 30: FZMU, FZZMU 400×65 specification



**Dimensions**

Dimension	FZMU 400×65			FZZMU 400×65			
	ID No.	49010	55445	55446	53895	55447	55448
L x D		400 × 65			400 × 65		
H		120			120		
K		6.5 × 12			6.5 × 12		
M		430			426		
O		485			450		
R		92			185		
U		64			150		
X		10			10		

Tab. 31: FZMU, FZZMU 400×65 dimensions [mm]

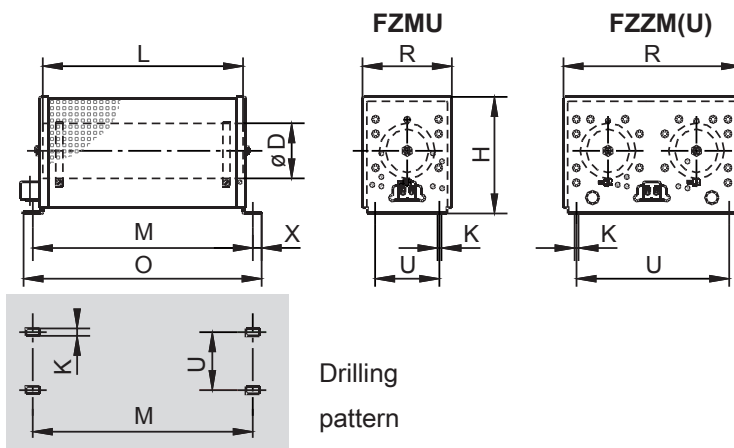


Fig. 2: FZMU, FZZMU 400×65 dimensional drawing



5.4.4.2 GVADU, GBADU flat resistor

Type	GVADU 210×20	GBADU 265×30	GBADU 405×30	GBADU 335×30	GBADU 265×30
ID No.	55441	55442	55499	55443	55444
SDS 5007A	X	X	X	—	—
SDS 5008A	X	X	X	—	—
SDS 5015A	X	X	X	—	—
SDS 5040A	X	X	X	X	—
SDS 5075A	—	—	—	X	—
SDS 5110A	—	—	—	—	X
SDS 5150A	—	—	—	—	X
SDS 5220A	—	—	—	—	X
SDS 5370A	—	—	—	—	X
SDS 5450A	—	—	—	—	X

Tab. 32: Assignment of GVADU, GBADU braking resistor – SDS 5000 inverters

Properties

Specification	GVADU 210×20	GBADU 265×30	GBADU 335×30	GBADU 405×30	
ID No.	55441	55442	55444	55443	55499
Type	Flat resistor	Flat resistor			
Resistance [Ω]	100	100	22	47	100
Power [W]	150	300	300	400	500
Therm. time const. $\tau_{th}$ [s]	60	60			
Pulse power for < 1 s [kW]	3.3	6.6	6.6	8.8	11
$U_{max}$ [V]	848	848			
Cable design	Radox	FEP			
Cable length [mm]	500	500			
Cable cross-section [AWG]	18/19 (0.82 mm <sup>2</sup> )	14/19 (1.9 mm <sup>2</sup> )			
Weight [g]	300	950	950	1200	1450
Protection class	IP54	IP54			
Test marks					

Tab. 33: GVADU, GBADU specification



**Dimensions**

Dimension	GVADU 210×20	GBADU 265×30		GBADU 335×30	GBADU 405×30
ID No.	55441	55442	55444	55443	55499
A	210	265		335	405
H	192	246		316	386
C	20	30		30	30
D	40	60		60	60
E	18.2	28.8		28.8	28.8
F	6.2	10.8		10.8	10.8
G	2	3		3	3
K	2.5	4		4	4
J	4.3	5.3		5.3	5.3
$\beta$	65°	73°		73°	73°

Tab. 34: GVADU, GBADU dimensions [mm]

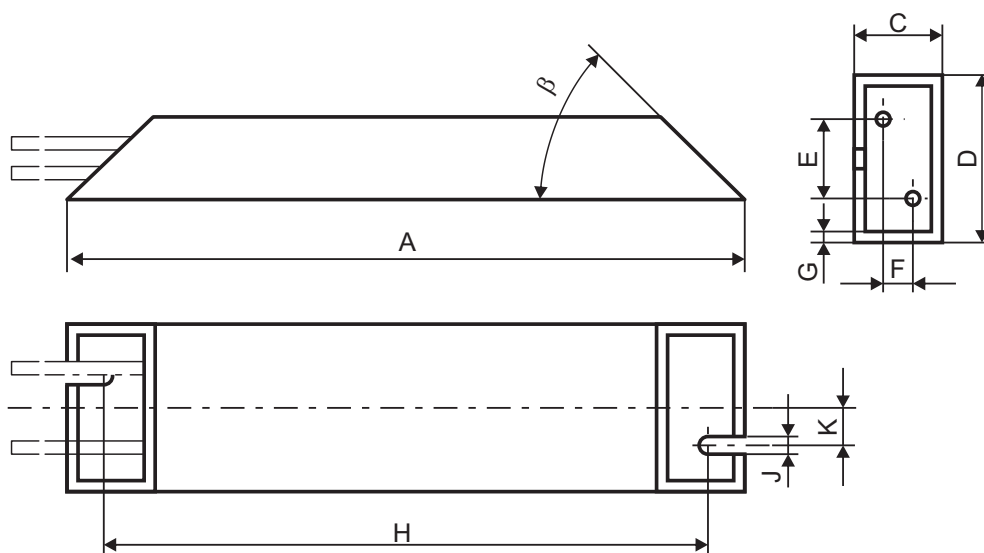


Fig. 3: GVADU, GBADU dimensional drawing



**5.4.4.3 FGFKU steel-grid fixed resistor**

SDS

Type	FGFKU			
ID No.	55449	55450	55451	53897
SDS 5110A	X	—	—	—
SDS 5150A	X	—	—	—
SDS 5220A	—	X	X	X
SDS 5370A	—	X	X	X
SDS 5450A	—	X	X	X

Tab. 35: Assignment of FGFKU braking resistor – SDS 5000 inverters

**Properties**

Specification	FGFKU			
ID No.	55449	55450	55451	53897
Type	Steel-grid fixed resistor		Steel-grid fixed resistor	Steel-grid fixed resistor
Resistance [ $\Omega$ ]	22	15	15	15
Power [W]	2500		6000	8000
Therm. time const. $\tau_{th}$ [s]	30		20	20
Pulse power for < 1 s [kW]	50		120	160
$U_{max}$ [V]	848		848	848
Weight [kg]	Approx. 7.5		12	18
Protection class	IP20		IP20	IP20
Test marks				

Tab. 36: FGFKU specification



**Dimensions**

Dimension	FGFKU				
	ID No.	55449	55450	55451	53897
A		270	370	370	570
B		295	395	395	595
C		355	455	455	655

Tab. 37: FGFKU dimensions [mm]

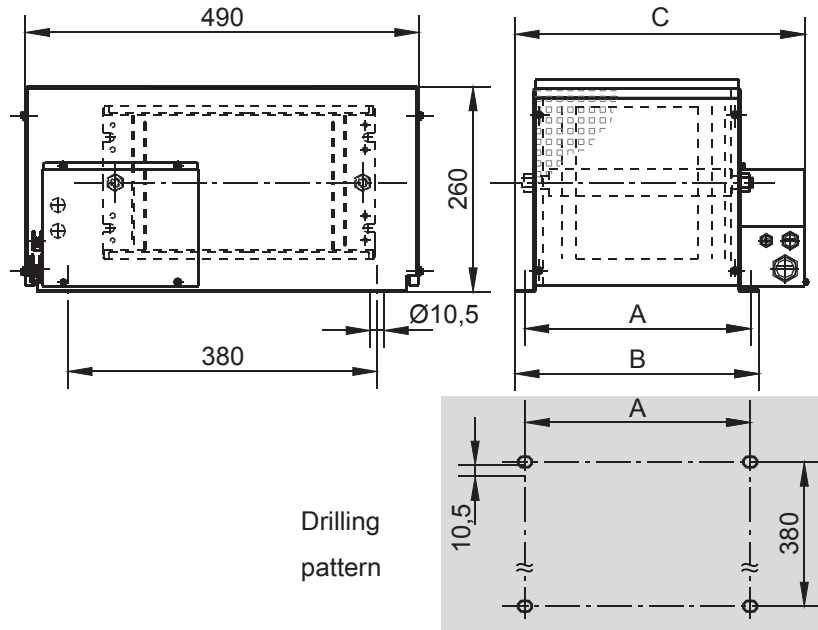


Fig. 4: FGFKU dimensional drawing





### 5.4.4.4 RB 5000 bottom brake resistor

SDS

Type	RB 5022	RB 5047	RB 5100
ID No.	45618	44966	44965
SDS 5007A	—	—	X
SDS 5008A	—	—	X
SDS 5015A	—	—	X
SDS 5040A	—	X	X
SDS 5075A	—	X	—
SDS 5110A	X	—	—
SDS 5150A	X	—	—

Tab. 38: Assignment of RB 5000 braking resistor – SDS 5000 inverters

#### Properties

Specification	RB 5022	RB 5047	RB 5100
ID No.	45618	44966	44965
Resistance [ $\Omega$ ]	22	47	100
Power [W]	100	60	60
Therm. time const. $\tau_{th}$ [s]	8		
Pulse power for < 1 s [kW]	1.5	1.0	1.0
$U_{max}$ [V]	800		
Weight [g]	approx. 640	approx. 460	approx. 440
Cable design	Radox		
Cable length [mm]	250		
Cable cross-section [AWG]	18/19 (0.82 mm <sup>2</sup> )		
Maximum torque of M5 threaded bolts [Nm]	5		
Protection class	IP40		
Test marks			

Tab. 39: RB 5000 specification

#### Dimensions

Dimension	RB 5022	RB 5047	RB 5100
ID No.	45618	44966	44965
Height	300	300	
Width	94	62	
Depth	18	18	
Drilling pattern corresponds to size	Size 2	Size 1	Size 0 and Size 1

Tab. 40: RB 5000 dimensions [mm]




### 5.4.5 TEP output choke

Output chokes are required starting from a cable length of > 50 m.

#### Information

The following technical data only applies to a rotating magnetic field frequency of 200 Hz. For example, this rotating magnetic field frequency is achieved with a motor with 4 pole pairs and a nominal speed of 3000 rpm. Always observe the specified derating for higher rotating magnetic field frequencies. Also observe the relationship with the clock frequency.

#### Properties

Specification	TEP3720-0ES41	TEP3820-0CS41	TEP4020-0RS41
ID No.	53188	53189	53190
Voltage range	3 × 0 to 480 V <sub>DC</sub>		
Frequency range	0 – 200 Hz		
I <sub>N</sub> at 4 kHz	4 A	17.5 A	38 A
I <sub>N</sub> at 8 kHz	3.3 A	15.2 A	30.4 A
Max. permitted motor cable length with output choke	100 m		
Max. surrounding temperature $\vartheta_{amb,max}$	40 °C		
Design	Open		
Winding losses	11 W	29 W	61 W
Iron losses	25 W	16 W	33 W
Connections	Screw terminals		
Max. conductor cross-section	10 mm <sup>2</sup>		
UL Recognized Component (CAN; USA)	Yes		
Test marks			

Tab. 41: TEP specification

#### Project configuration

Select the output chokes in accordance with the rated currents of the motor and output chokes. In particular, observe the derating of the output choke for rotating magnetic field frequencies higher than 200 Hz. You can calculate the rotating magnetic field frequency for your drive with the following formula:

$$f_N = n_N \times \frac{p}{60}$$



### Derating

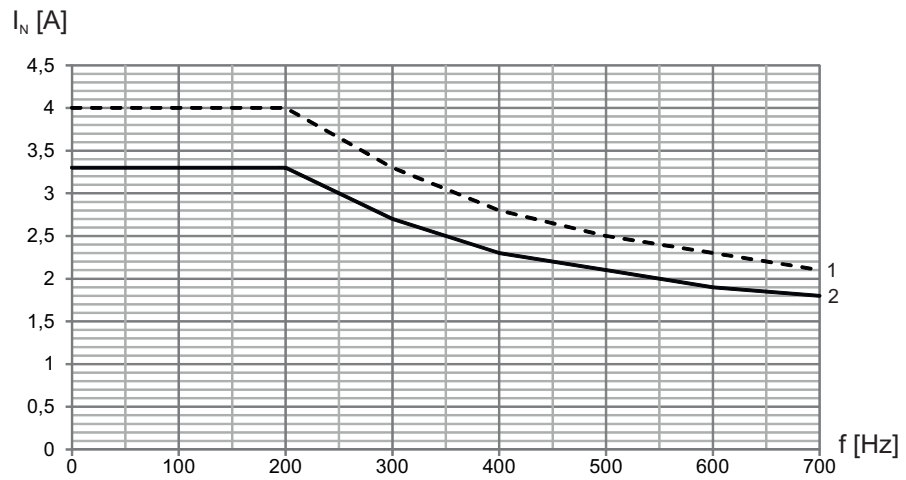


Fig. 5: TEP3720-0ES41 derating

- 1 4 kHz clock frequency
- 2 8 kHz clock frequency

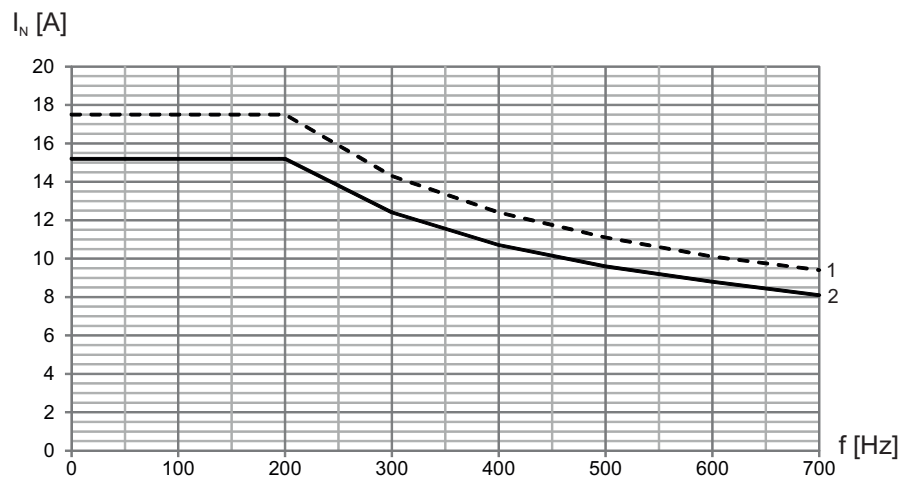


Fig. 6: TEP3820-0CS41 derating

- 1 4 kHz clock frequency
- 2 8 kHz clock frequency

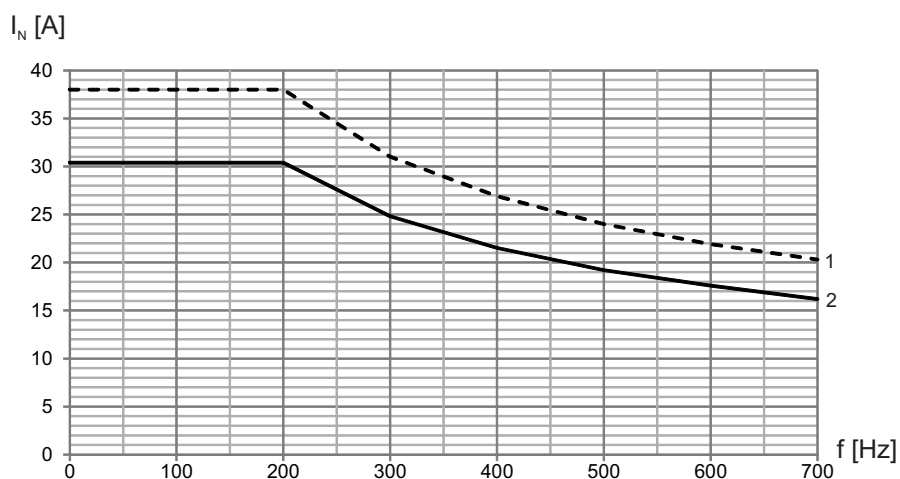


Fig. 7: TEP4020-0RS41 derating

1	4 kHz clock frequency
2	8 kHz clock frequency

**Dimensions and weight**

Dimension	TEP3720-0ES41	TEP3820-0CS41	TEP4020-0RS41
Height h [mm]	Max. 153	Max. 153	Max. 180
Width w [mm]	178	178	219
Depth d [mm]	73	88	119
Vertical distance – Fastening holes a1 [mm]	166	166	201
Vertical distance – Fastening holes a2 [mm]	113	113	136
Horizontal distance – Fastening holes b1 [mm]	53	68	89
Horizontal distance – Fastening holes b2 [mm]	49	64	76
Drill holes – Depth e [mm]	5.8	5.8	7
Drill holes – Width f [mm]	11	11	13
Screw connection – M	M5	M5	M6
Weight [kg]	2.9	5.9	8.8

Tab. 42: TEP dimensions and weight

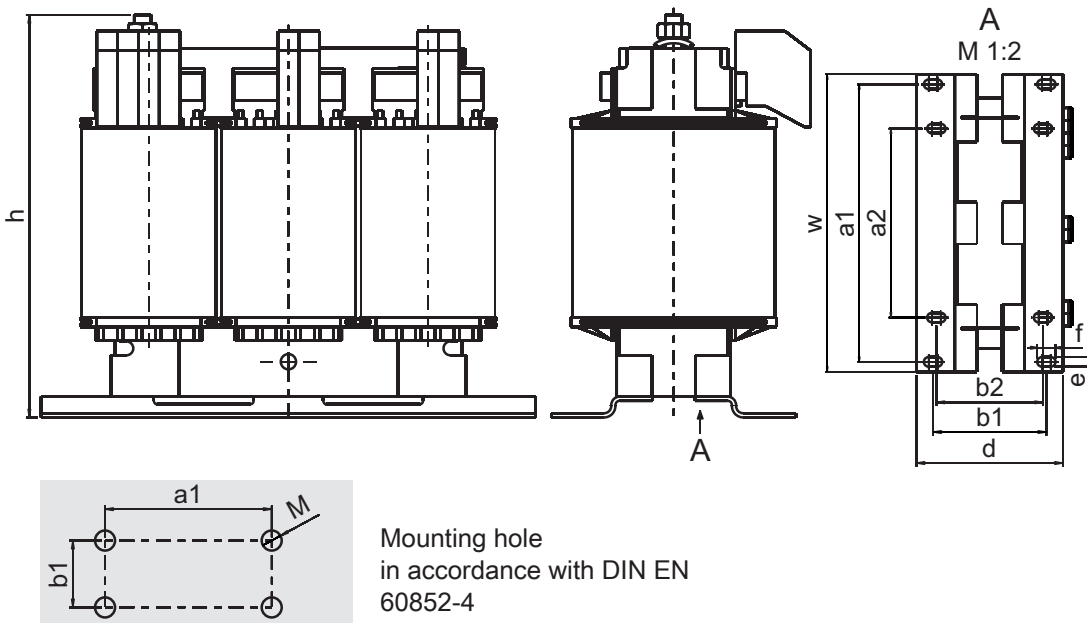


Fig. 8: TEP dimensional drawing

### 5.4.6 Brake module and EMC shroud

#### BRS 5001 brake module



ID No. 56519

Brake module for inverters of the SDS 5000 series.

Accessory for directly controlling up to two motor stopping brakes (24 V<sub>DC</sub>) and (for inverters up to size 2) connecting to the shield of the power cable.

Can be mounted on the base housing.

Includes connecting cable to the base unit and shielding connection terminal.

#### EM 5000 EMC shroud



ID No. 44959

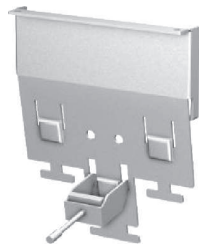
EMC shroud for inverters of the FDS 5000 and MDS 5000 series.

Accessory for the shield connection of power cable for inverters up to size 2.

Can be attached to the basic housing.

Shield connection terminal included.

#### EMC shroud EM6A3



ID No. 135120

EMC shroud for size 3.

Accessory part for the shield connection of the motor line.

Can be attached to the basic housing.

Shield connection terminal included.

If necessary, you can also attach the cable shield of the braking resistor and DC link connection to the shroud. Additional shield connection terminals are available as accessories for this purpose (ID No. 56521).



## 5.4.7 Axis switcher

### POSISwitch AX 5000 4-way axis switcher



ID No. 49578

Enables the operation of up to four servo motors on one inverter.

### LA6 / AX 5000 connection cable



Cable to connect inverter and POSISwitch AX 5000 axis switcher.

The following versions are available:

ID No. 45405: 0.5 m.

ID No. 45386: 2.5 m.

## 5.4.8 Battery module for encoder buffering

### Absolute Encoder Support (AES)



ID no. 55452

For buffering the power supply when using the EnDat 2.2 digital inductive absolute encoder with battery-buffered multi-turn power unit, for example EBI1135, EBI135.

A battery is included.

### AES replacement battery



ID No. 55453

Replacement battery for AES battery module.



## 5.4.9 Removable data storage

### Paramodul removable data storage

Included in the standard version.



ID No. 55464  
Memory module for configuration and parameters.

## 5.4.10 Product CD

### ELECTRONICS 5000 product CD

Included in the standard version.



ID No. 441852  
The CD-ROM contains the POSITool project configuration and commissioning software, documentation as well as the device description files for the inverter – controller connection.

## 5.5 Further information

### 5.5.1 Symbols, identifiers and test marks



**Grounding symbol**  
Grounding symbol in accordance with IEC 60417-5019 (DB:2002-10).



**RoHS lead-free marking**  
Marking in accordance with RoHS directive 2011-65-EU.



**CE mark**  
Manufacturer's self declaration: The product meets the requirements of EU directives.



**UL mark**  
This product is listed by UL for the United States and Canada. Representative samples of this product have been evaluated by UL and meet the requirements of applicable standards.



**UL test marks for recognized components**  
This component or material is recognized by UL. Representative samples of this product have been evaluated by UL and meet applicable requirements.

## 5 POSIDYN SDS 5000 servo inverters

### 5.5 Further information

