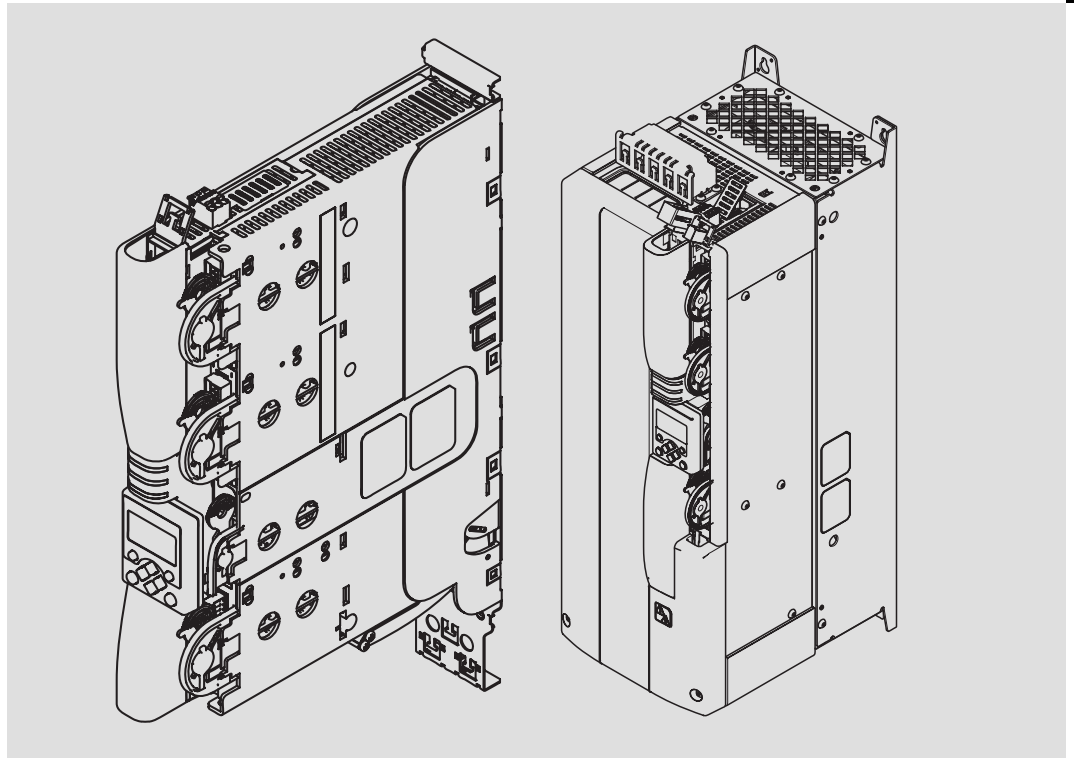


L-force *Drives*



Hardware Manual

9400



E94A...

Servo Drives 9400

Lenze

8.5	Basic dimensioning	328
8.5.1	General information	328
8.5.2	Power distribution of controllers	329
8.5.3	Motor efficiency	330
8.5.4	Power loss of devices	330
8.5.5	Determining the power requirements	330
8.5.6	Determining the regenerative power requirements	330
8.5.7	Cable protection	331
8.5.8	Filters	331
8.5.9	Cables	334
8.6	Braking operation in a drive system	335
8.6.1	Basic considerations	335
8.7	Application examples	336
8.7.1	Example 1 - supply module with multi-axis controllers	336
8.7.2	Example 2 - single-axis controller with multi axes	337
9	Accessories (overview)	339
9.1	Overview	341
9.1.1	System overview	341
9.1.2	Assignment of accessories	343
9.2	Type-specific accessories	345
9.3	Communication modules	346
9.3.1	Possible device module combinations	348
9.3.2	Ethernet interface	349
9.3.3	DeviceNet	371
9.3.4	PROFIBUS	376
9.3.5	PROFINET	382
9.3.6	CAN port	386
9.4	Function modules	390
9.4.1	Digital frequency	392
9.5	Memory modules	396
9.6	Safety modules	403
9.6.1	SM0	406
9.6.2	SM100	407
9.6.3	SM301	411
9.7	Motor holding brake control modules	419
9.7.1	Motor holding brake control module E94AZHX0051	420
9.7.2	Motor holding brake control module E94AZHY0101	429
9.7.3	Motor holding brake control module E94AZHN0025	439
9.7.4	Motor holding brake control module E94AZHY0025	446
9.7.5	Motor holding brake control module E94AZHN0026	452
9.7.6	Motor holding brake control module E94AZHY0026	460

Free spaces, 493

Function modules, 386

Fuses, 164

- Rated power operation, 400 V (UL), 62, 63, 221, 222, 270

G

General accessories, 552

General data, 35, 153, 211, 214, 259, 261, 493, 499, 509, 517, 526, 535, 539, 544, 549, 560, 562, 566

Guide, 19

H

Harmonic currents, limitation according to EN 61000-3-2, 40, 156

I

Identification, 345, 348, 354, 358, 362, 367, 372, 378, 382, 388, 395, 396, 397, 398, 399, 416, 425, 435, 442, 448, 456, 463, 465, 477, 492, 498, 508, 516, 525, 535, 539, 544, 548, 559, 561, 565

Increased continuous power, 52, 59

Installation

- mechanical, 88, 174, 230, 281
- standard device, 192

Interface, CAN, 382

IT system, Disconnecting the EMC filters from PE, 99, 182, 241, 290

L

Labelling, controller, 17

Legal regulations, 17

Liability, 18

M

Mains current

- with external mains choke, 46, 49, 50, 56, 57
- with/without mains choke, 46, 49, 50, 56, 57

Mains filter, 280, 283

Manufacturer, 17

Mechanical installation, 88, 174, 230, 281

Memory modules, 392

Monitoring functions, 419, 429

Motor cable

- capacitance per unit length, 37, 155
- requirements, 37, 155

Motor holding brakes, Control module

- E94AZHN0025, 435
- E94AZHN0026, 448
- E94AZHX0051, 416
- E94AZHY0025, 442
- E94AZHY0026, 456
- E94AZHY0101, 425

Motor power, typical, 46, 49, 50, 56, 57

Motor protection, 31

Motors, suitable, 17

Mounting clearances, 35, 153, 212, 260

Mounting conditions

- Dimensions, 493
- Free space, 499, 509, 517, 526
- free space, 549
- Free spaces, 493
- mounting clearances, 436, 449
- Mounting place, 493, 499, 509, 517, 526
- mounting place, 549
- Mounting position, 493, 499, 509, 517, 526
- mounting position, 436, 449, 549
- Weights, 493

Mounting place, 493, 499, 509, 517, 526

Mounting position, 35, 153, 212, 260, 493, 499, 509, 517, 526

N

Nameplate data, 345, 358, 367, 372, 378, 382, 395, 396, 397, 399, 416, 425, 435, 442, 448, 456, 463, 477, 492, 498, 508, 516, 525, 535, 539, 544, 548, 559, 561, 565

Nameplate information, 348, 354, 362, 388, 465

Network of several drives, Basic dimensioning, 324

Noise emission, 40, 156

Noise immunity, 40, 156, 211, 259

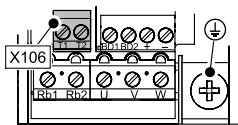
Notes, definition, 32


O

Operating conditions, 36, 154, 213, 417, 426, 436, 443, 449, 457, 478, 558

- Mounting conditions
Dimensions, 493
Free space, 493, 499, 509, 517, 526
Mounting place, 493, 499, 509, 517, 526
Mounting position, 493, 499, 509, 517, 526
Weight, 493

Motor temperature monitoring

Terminal X106	Labelling	Description
 <p>SSP940X106</p>	T1 T2	Motor temperature monitoring with PTC element (type-A sensor, switching performance according to EN 60947-8 for type-A tripping units) or thermostat (NC contact).

Terminal data					
	Max. conductor cross-section		Tightening torque		 PZ0
	[mm ²]	[AWG]	[Nm]	[lb-in]	
Flexible	2.5	12	0.5 ... 0.6	4.5 ... 6.2	PZ0
With wire end ferrule					

Motor brake control (optional)



Note!

When the 24 V supply voltages (at X2) are applied and a motor holding brake is available, the devices respond as follows:

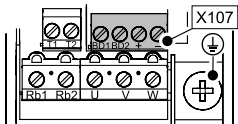
- ▶ SingleDrive without mains or DC-bus voltage: The motor holding brake cannot be released.
- ▶ MultiDrive without DC-bus voltage: The motor holding brake can be released.



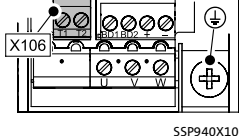
Tip!

For detailed information on the motor holding brake control modules, please see the chapter Accessories (419).


For information on the E94AZHX0051 motor holding brake control module optionally contained in the installation backplane, please see the chapter Accessories starting on page 420.

Terminal X107	Labelling	Description
 <p>SSP940X107</p>	BD1 BD2	Connection of the motor holding brake + (Lenze: WH) - (Lenze: BN) E94AZHX0051: 24 V DC, max. 2.5 A Observe correct polarity!
	+ / -	Supply voltage for the motor holding brake (18 ... 30 V DC) Observe correct polarity!

Motor temperature monitoring

Terminal X106	Labelling	Description
	T1 T2	Motor temperature monitoring with PTC element (type-A sensor, switching performance according to EN 60947-8 for type-A tripping units) or thermostat (NC contact).

SSP940X106

Terminal data					
	Max. conductor cross-section		Tightening torque		
	[mm ²]	[AWG]	[Nm]	[lb-in]	
Flexible	2.5	12	0.5 ... 0.6	4.5 ... 6.2	PZ0
With wire end ferrule					

Motor brake control (optional)

**Note!**

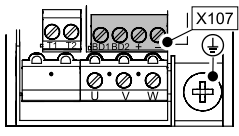
When the 24 V supply voltages (at X2) are applied and a motor holding brake is available, the devices respond as follows:

- ▶ SingleDrive without mains or DC-bus voltage: The motor holding brake cannot be released.
- ▶ MultiDrive without DC-bus voltage: The motor holding brake can be released.

**Tip!**

For detailed information on the motor holding brake control modules, please see the chapter Accessories (419).

For information on the E94AZHX0051 motor holding brake control module optionally contained in the installation backplane, please see the chapter Accessories starting on page 420.

Terminal X107	Labelling	Description
	BD1 BD2	Connection of the motor holding brake + (Lenze: WH) - (Lenze: BN) E94AZHX0051: 24 V DC, max. 2.5 A Observe correct polarity!
	+ / -	Supply voltage for the motor holding brake (18 ... 30 V DC) Observe correct polarity!

SSP940X107

9 Accessories (overview)



Note!

You can find additional information on the accessories in the catalogue to this product series.

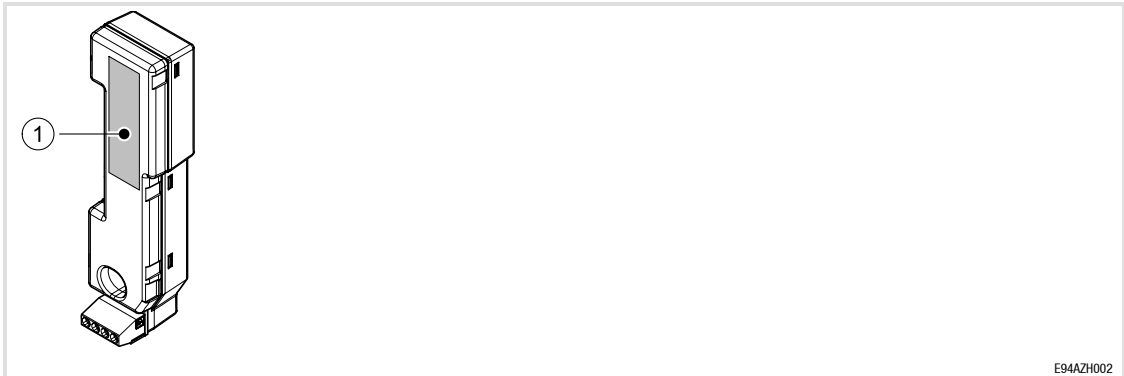
9.1	Overview	341
9.1.1	System overview	341
9.1.2	Assignment of accessories	343
9.2	Type-specific accessories	345
9.3	Communication modules	346
9.3.1	Possible device module combinations	348
9.3.2	Ethernet interface	349
9.3.3	DeviceNet	371
9.3.4	PROFIBUS	376
9.3.5	PROFINET	382
9.3.6	CAN port	386
9.4	Function modules	390
9.4.1	Digital frequency	392
9.5	Memory modules	396
9.6	Safety modules	403
9.6.1	SM0	406
9.6.2	SM100	407
9.6.3	SM301	411
9.7	Motor holding brake control modules	419
9.7.1	Motor holding brake control module E94AZHX0051	420
9.7.2	Motor holding brake control module E94AZHY0101	429
9.7.3	Motor holding brake control module E94AZHN0025	439
9.7.4	Motor holding brake control module E94AZHY0025	446
9.7.5	Motor holding brake control module E94AZHN0026	452
9.7.6	Motor holding brake control module E94AZHY0026	460
9.8	Accessories for diagnostics	467
9.8.1	USB diagnostic adapter	467
9.8.2	Keypad	469
9.8.3	Hand-held terminal	476
9.9	Components for operation in the DC-bus connection	481
9.9.1	DC-feeding point	481
9.9.2	GG1 busbar mounting set	488
9.9.3	GG2 busbar mounting set	490
9.9.4	GG3 busbar mounting set	492

Accessories (overview)

Motor holding brake control modules
 Motor holding brake control module E94AZHX0051

9.7.1 Motor holding brake control module E94AZHX0051

Identification



E94AZH002

Type code

①						
E94	A	Z	H	x	005	1

Product series

Device generation

Accessories

Motor brake control type

Rated current

005 = 2.5 A

Voltage class

1 = 24 V

Scope of supply



E94AZH001

Pos.	Description
	Motor brake control E94AZHX0051
	Mounting Instructions

Elements of the motor brake control

Pos.	Description
A	Nameplate
B	Connection of the installation backplane
X107	Connection of supply and brake

Standards

Conformity	CE	Low-Voltage Directive
Approvals	UL (only for use with E94 series)	UL508, Industrial Control Equipment, Underwriter Laboratories (File No. E232497) for USA and Canada

Operating conditions

The operating conditions correspond to the operating conditions for the standard device to which the DC-feeding point is connected.

General electrical data

Operating frequency	Max. 6/min
Operating times	Can be ignored compared to the delay time of the brake. See documentation of the brake.
Service life	> 10 millions of cycles
Protection against	
Overload	No
Short circuit of the terminals	Yes
Polarity reversal at the input	Yes
Insulation ¹⁾	Double insulation (EN61800-5-1: $V_{rated} = 300 \text{ V AC}$), Separation (UL: $V_{rated} = 500 \text{ V AC}$)

¹⁾ Brake connection against control card of the controller

Rated data

Type	Voltage $U_{DC} \text{ [V]}$	Current $I_{DC} \text{ [A]}$	Power $P_{DC} \text{ [W]}$	Breaking energy $E \text{ [Ws]}$
E94AZHX0051	18 ... 30	0.3 ... 2.5	max. 55	max. 5

Accessories (overview)

Motor holding brake control modules

Motor holding brake control module E94AZHX0051

Safety instructions



During installation the notes given in the documentation for the standard device must be observed!



Stop!

The motor brake control includes an electronic switch which can control a 24 V motor holding brake.

The motor brake control may only be connected with motor holding brakes which correspond to the permissible data mentioned in the technical data. (If required, the holding brake without motor brake control must be controlled via a digital output and a coupling relay).

If the permissible data mentioned in the technical data are not complied with:

- ▶ the motor brake control can be destroyed.
- ▶ a safe operation of the motor holding brake cannot be guaranteed.

Further notes in the documentation of the standard device must be observed!



Stop!

Requirements concerning the brake cable (connection BD1/BD2):

- ▶ The brake cables must be shielded if they are incorporated in the motor cable.
 - Operation with unshielded brake cables can destroy the motor brake control.
 - We recommend the use of Lenze system cables (motor cable with separately shielded additional cores).
- ▶ When using a permanent magnet holding brake, ensure the correct polarity of the brake cable.
 - If the terminals are reversed, the brake does not release. Since the motor runs against the closed brake, the brake can be destroyed.
- ▶ Connect the shield on both sides of PE.

Requirements concerning the supply voltage U_{DC} (connection +/-):

- ▶ The motor brake control must always be supplied with a separate 24 V supply.
 - A common supply of the motor brake control and the control card of the controller is not permissible since otherwise the double insulation between both components would be reduced.
- ▶ Set U_{DC} so that the operating voltage of the brake is within the admissible range and the maximum supply voltage of the motor brake control will not be exceeded.