Frequency inverter

Versatile, robust, tried-and-tested

Lenze

Our principles.
Do you want to effectively and simply produce your machine and plant concepts or optimise existing concepts and thereby cut costs? Then Lenze is the partner for you. Drive and automation technology is what we do and have been doing for more than 60 years.

Drive and automation technology set in motion by Lenze – for example in logistics centres, in the textile and printing industry, in the automotive industry or as the driving force behind robots.

Lenze about us

We can offer you automation solutions, including control, visualisation and drive technology, from a single source. Our drive systems will improve the performance of your machines. From project planning to commissioning, we have the know-how. Our international sales and service network can provide you with expert help and advice at any time.

Cut your process costs and increase your ability to compete. Let us analyse your drive technology tasks and support you with made-to-measure solutions. We can take an integrated approach to projects thanks to the scalability of our products and the scope of the overall portfolio. We can get the best from your machines and systems.

At your side all over the world – with thorough and professional support from our motivated team.

System overview | Frequency inverter

Other catalogues

This catalogue contains the frequency inverters and accessories for the smd, 8200 vector, 9300 vector and 8200 motec series. Other components and system solutions can be found in the following catalogues.

components	CATALOGUE
Human machine interface	▶ PC-based automation
I/O system	▶ PC-based automation
Remote maintenance	▶ PC-based automation
Inverter Drives 8400	▶ Inverter Drives 8400
Standard motors	▶ Three-phase AC motors
Standard geared motors	▶ G-motion const
Geared motors with integrated frequency inverter	▶ G-motion motec
ATEX-compliant geared motors	▶ G-motion ATEX

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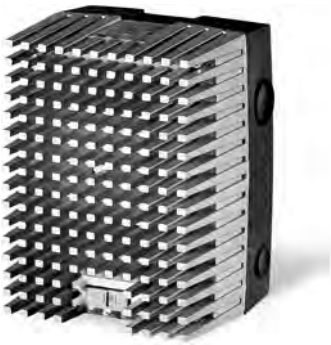

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smd product key

ESMD 751 x 2 S F A

Power
e.g. 751 - 750 W
e.g. 752 - 7.5 kW
e.g. 113 - 11 kW

Voltage class
2 – 230/240 V
4 – 400/480 V

Mains phases
S – single-phase
T – three-phase
Y – single and three-phase

RFI filter
X – no RFI filter
F – RFI filter integrated

8200 vector product key

E82 E V 751 K 2 C x x x

Design
E – installation
C – cold plate technology (0.25 ... 22 kW)

Power
e.g. 751 - 0.75 kW
e.g. 752 - 7.5 kW
e.g. 113 - 11 kW

Voltage class
2 – 230/240 V
4 – 400/500 V

Variant
– standard, RFI filter integrated (0.25 ... 11 kW)
1 – IT system
2 – no RFI filter

0 – not coated (0.25 ... 11 kW)
1 – coated (15 ... 90 kW)

302 – with footprint mains filter (15 ... 90 kW)

9300 vector product key

EVF 9321 – E V V xxx

Power
9321 - 0.37 kW
9322 - 0.75 kW
9323 - 1.5 kW
9324 - 3.0 kW
9325 - 5.5 kW
9326 - 11 kW
9327 - 15 kW
9328 - 22 kW
9329 - 30 kW
9330 - 45 kW
9331 - 55 kW
9332 - 75 KW
9333 - 90 kW

Design
E – installation
C – cold plate technology (0.37 ... 22 kW)

Variant
– Standard
V003 – cold plate technology
V004 – safe standstill
V024 – safe standstill and IT system
V100 – IT system

8200 motec product key

E82 M V 751 _ 4 B 001

Power
e.g. 751 - 0.75 kW
e.g. 752 - 7.5 kW

Voltage class
2 – 230/240 V
4 – 400/500 V

List of abbreviations

B [mm]	Width
C [µF]	Integrated DC-bus capacity
f_d [Hz]	Field frequency
f_{ch} [kHz]	Switching frequency
H [mm]	Height
i	Transmission ratio of the gearbox
I_{DC} [A]	Rated DC-bus current
I_{max} [A]	Maximum output current
I_N [A]	Rated current
I_{Netz} [A]	Rated mains current
I_{Z_KN} [A]	DC-bus current
I_{ZK_max} [A]	Maximum output current of supply module
l [m]	Motor cable length
m [kg]	Mass
M_{eff} [Nm]	Effective torque
M_{max} [Nm]	Maximum torque
n_{max}	Max. speed
P_N [kW]	Typical motor power
P_v [W]	Power loss
R [Ohm]	Resistance
T [mm]	Depth
U_{DC} [V]	DC input voltage
U_{Netz} [V]	Mains voltage range Rated mains voltage
U_{ZK} [V]	DC-bus voltage
v	Pulse/pause ratio
WK [kWs]	Thermal capacity

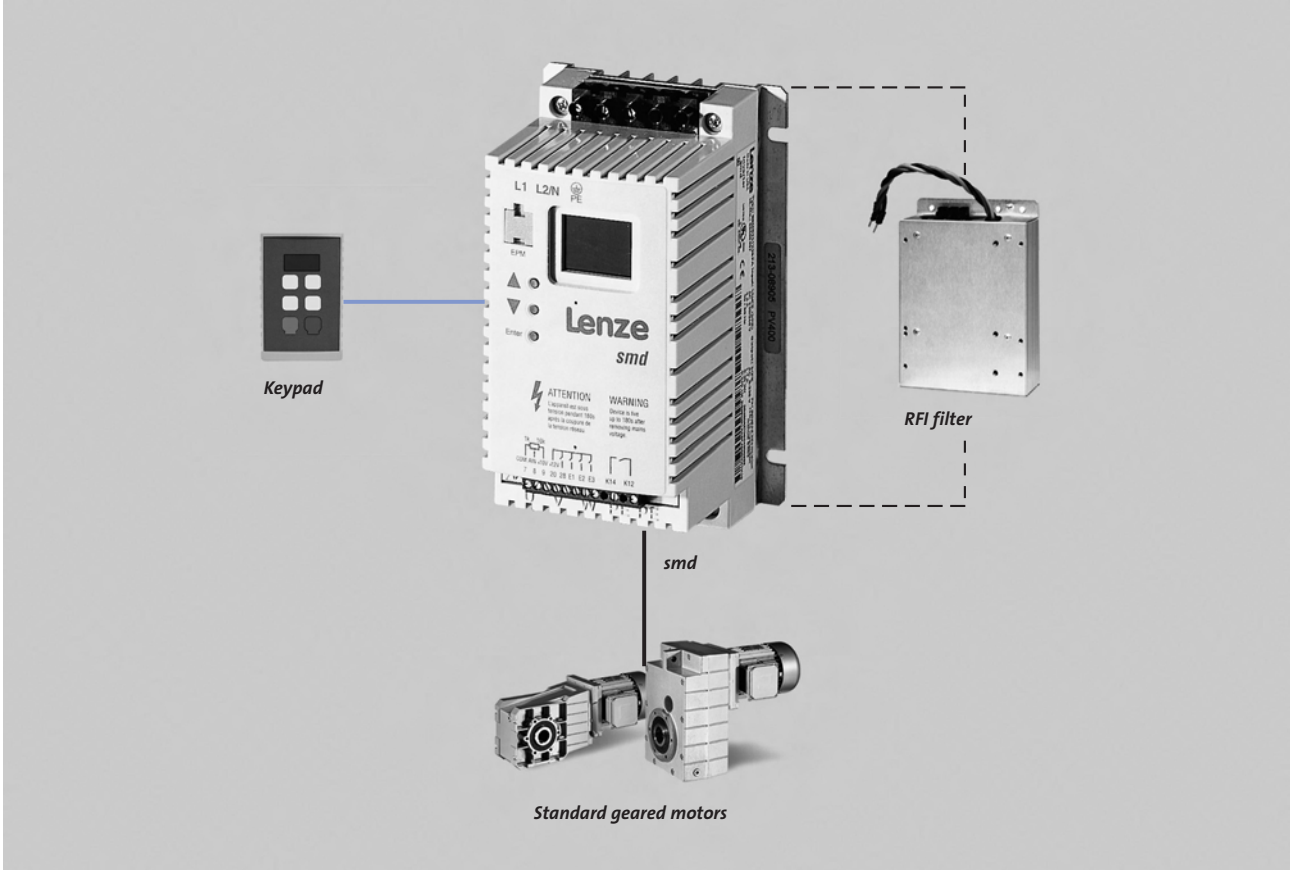
AIF	Application interface
cUL	Canadian Standard Underwriters Laboratory Listed Product
DIAG	Slot for diagnostic adapter
DIN	Deutsches Institut für Normung e.V.
EMC	Electromagnetic compatibility
EN	European standard
EN 60529	Degrees of protection provided by enclosures (IP code)
EN 60721-3	Classification of environmental conditions; Part 3: Classes of environmental parameters and their limit values
EN 61800-3	Electrical variable speed drives Part 3: EMC requirements including special test methods
EN 61800-5-1	Electric power drive systems with adjustable speed - part 5-1: Safety requirements; electrical, thermal, and energetic requirements
EN 954-1	Safety-related parts of control systems Control category 3
FIF	Function interface
IEC	International Electrotechnical Commission
IEC 61131-2	Programmable logic controllers Part 2: Equipment and tests
IEC 61131-3	Programming languages for PLCs, part 3 Programming
IEC 61508	Functional safety of electrical/electronic/ programmable electronic safety-related systems
IM	International Mounting Code
IP	International Protection Code
KTY	Continuous temperature sensor
NEMA	National Electrical Manufacturers Association
PE	PE conductor
PLC	Programmable logic controller
TTL	Signal level 5V
UL	Underwriters Laboratory Listed Product
UR	Underwriters Laboratory Recognized Product
VDI 2143	Motion rules for cam mechanisms

About this catalogue

This catalogue contains all components of the frequency inverter product range.

For some components the "arrow" symbol appears together with an identifier printed in bold. This identifier can be retrieved directly in the electronic catalogue. The catalogue can be found online at:
www.lenze.de/dsc

Inverters and accessories



smd – for simple applications

Do you use digital and analogue inputs, preset speeds or a display with keypad for your applications? Is space in your control cabinet tight and is your budget tight too? The smd frequency inverter is a zero-compromise solution. The smd covers a power range of 0.25 ... 22 kW and handles everything you could possibly need of a universal use frequency inverter today. A large range of applications can be easily solved using clear functions.

All you need is three on-board operator buttons and a handful of parameters – commissioning is child's play. The parameter setting can be saved on one single chip. The Electronic Programmable Module (EPM) is a pluggable memory chip designed especially for the smd. The EPM allows you to transfer set drive data to other frequency inverters in the series as often as you want. Modified drive parameters are also handled in a matter of seconds by simply replacing the EPM on the front of the frequency inverter.

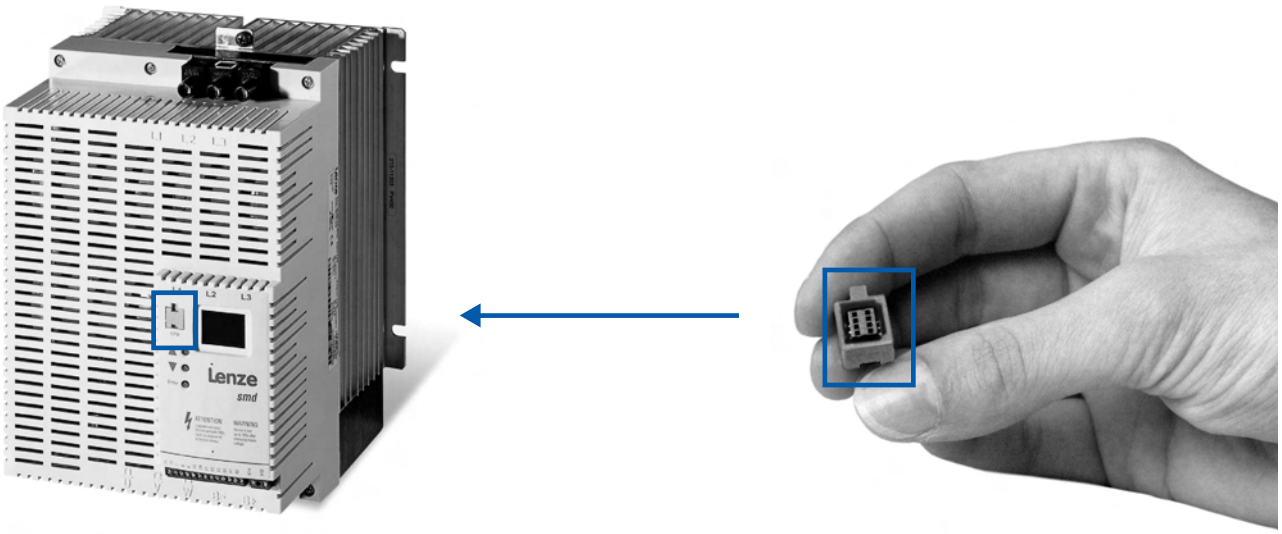
Programming is undertaken on the inverter itself or via a battery-operated EPM (Electronic Programmable Module) programming unit. Configurations can then be conveniently produced or edited offline. The device saves up to 30 different drive programs as a file. You can copy from EPM to EPM, file to EPM or write the EPM back to a file in a couple of seconds at the push of a button.

The frequency inverter has integrated motor overload protection. To achieve this a microprocessor calculates the motor load regardless of output speed, protects the motor and makes additional hardware superfluous.

The function and number of control terminals corresponds to the usual Lenze standard:

- start-stop function
- analogue setpoint selection with voltage or current freely
- programmable inputs
- freely programmable relay output

The smd has a current limitation with reduced frequency for stable operation, a clearly legible LED display and scope for low-noise operation thanks to an adjustable switching frequency of up to 10 kHz.



Functions and features

Control modes/motor control	V/f control (linear or quadratic)
Basic functions	Fault history buffer DC brake function Max. output frequency 500 Hz S-ramps for smooth acceleration Fixed frequencies Freely configurable inputs and outputs
Monitoring and protective measures	Short circuit Earth fault Overvoltage Motor stalling I² x t-Motor monitoring
Diagnostics Status displays	3 LEDs
Braking operation Brake chopper	External (400 V types)
Brake resistance	External (400 V types)

Control connections

Design	smd ESMD□□□X2SFA	smd ESMD□□□L4TXA
Inputs/outputs		
Analog inputs	▶ Quantity: 1 ▶ Voltage or current input (can be switched over) ▶ Value range: 0 ... 10 V, 4 ... 20 mA	▶ Quantity: 1 ▶ Voltage or current input (can be switched over) ▶ Value range: 0 ... 10 V, 4 ... 20 mA
Analog outputs		▶ Quantity: 1 ▶ Value range: 0 ... 10 V
Digital inputs	▶ Quantity: 4 ▶ Switching level: PLC (IEC 61131-2)	▶ Quantity: 4 ▶ Switching level: PLC (IEC 61131-2)
Digital outputs		▶ Quantity: 1 ▶ Switching level: PLC (IEC 61131-2) ▶ Max. output current: 50 mA
Relay	▶ Quantity: 1 ▶ Contact: normally open ▶ AC connection: 250 V, 3 A ▶ DC connection: 24 V, 2 A	▶ Quantity: 1 ▶ Contact: normally open ▶ AC connection: 250 V, 3 A ▶ DC connection: 24 V, 2 A
Interfaces		
Integrated		▶ CAN bus (system bus) ▶ RS485, LECOM, Modbus

→ Circuit diagrams
DS_GD_smd_0002
Available for download at www.lenze.de/dsc

Standards and operating conditions

Conformity	CE: Low-Voltage Directive (2006/95/EC)
Approvals UL 508C	Power Conversion Equipment (file no. 132659)
Enclosure EN 60529	IP20
Climatic conditions Storage (EN 60721-3-1) Transport (EN 60721-3-2) Operation (EN 60721-3-3) Rated output current derating	 1K3 (temperature: -20 °C ... + 60 °C) 2K3 (temperature: -25 °C ... + 70 °C) 3K3 (temperature: 0 °C ... + 55 °C) above + 40 °C by 2.5 %/°C
Permissible installation height Rated output current derating	0 ... 4000 m amsl Above 1000 m amsl by 5%/1000 m
Vibration resistance	Acceleration resistant up to 0.7 g according to Germanischer Lloyd, general conditions

Permissible supply forms	Systems with earthed star point (TN and TT systems)
Noise emission EN 61800-3	Conducted emissions, category C2 up to 10 m shielded motor cable: depending on device version with integrated RFI measures or additional RFI filter
Insulation resistance EN 61800-5-1	Overvoltage category III, Above 2000 m amsl overvoltage category II
Pollution degree EN 61800-5-1	2
Protective insulation of control circuits EN 61800-5-1	Base-insulated (single isolating distance)

Rated data

- The data is valid for operation at 1 /PE AC 230 V.
- Unless otherwise specified, the data refers to the default setting with a switching frequency of 8 kHz.

→ Other rated data
DS_GD_smd_0001
Available for download at www.lenze.de/dsc

Motor power (asynchronous motor, 4-pole)	P_N [kW]	**0.25**	**0.37**	**0.55**
Product key		**ESMD251X2SFA**	**ESMD371X2SFA**	**ESMD551X2SFA**
Mains voltage range [3]	U_{Netz} [V]	1/N/PE AC 180 V-0 % ... 264 V+0 %; 48 Hz-0 % ... 62 Hz+0 %		
Rated mains current Without mains choke	I_{Netz} [A]	3.4	5	6
Rated output current 8 kHz	I_N [A]	1.7	2.4	3
Max. output current 8 kHz [1]	I_{max} [A]	2.6	3.6	4.5
Power loss	P_V [W]	23	31	34
Dimensions				
Height	**H** [mm]	146		
Width	**B** [mm]	93		
Depth	**T** [mm]	83		92
Mass	**m** [kg]	0.5		0.6
Permissible motor cable length				
Shielded [2]	**l** [m]	50		
Unshielded [2]	**l** [m]	100		

[1] 60 s
[2] Permissible cable length may be affected if EMC conditions have to be met.
[3] Filter integrated: max. 10 m motor cable (shielded) with category C2 according to EN 61800-3

→ Dimensioned drawings
DS_MB_smd_0001
Available for download at www.lenze.de/dsc

Rated data

- The data is valid for operation at 1 /PE AC 230 V.
- Unless otherwise specified, the data refers to the default setting with a switching frequency of 8 kHz.

→ Other rated data
DS_GD_smd_0001
Available for download at www.lenze.de/dsc

Motor power (asynchronous motor, 4-pole)	P_N [kW]	**0.75**	**1.5**	**2.2**
Product key		**ESMD751X2SFA**	**ESMD152X2SFA**	**ESMD222X2SFA** [4]
Mains voltage range [3]	U_{Netz} [V]	1/N/PE AC 180 V-0 % ... 264 V+0 %; 48 Hz-0 % ... 62 Hz+0 %		
Rated mains current Without mains choke	I_{Netz} [A]	9	14	18
Rated output current 8 kHz	I_N [A]	4	7	9.5
Max. output current 8 kHz [1]	I_{max} [A]	6	10.5	14.3
Power loss	P_V [W]	47	71	108
Dimensions				
Height	**H** [mm]		146	
Width	**B** [mm]	93	114	
Depth	**T** [mm]	92	124	140
Mass	**m** [kg]	0.6	1.2	1.4
Permissible motor cable length				
Shielded [2]	**l** [m]		50	
Unshielded [2]	**l** [m]		100	

[1] 60 s
[2] Permissible cable length may be affected if EMC conditions have to be met.
[3] Filter integrated: max. 10 m motor cable (shielded) with category C2 according to EN 61800-3
[4] Operation only permissible with mains choke, type ELN1-0250H018

→ Dimensioned drawings
DS_MB_smd_0001
Available for download at www.lenze.de/dsc

Rated data

- The data is valid for operation at 3/PE AC 400 V.
- Unless otherwise specified, the data refers to the default setting with a switching frequency of 8 kHz.

→ Other rated data
DS_GD_smd_0001
Available for download at www.lenze.de/dsc

Motor power (asynchronous motor, 4-pole)	P_N [kW]	**0.37**	**0.75**	**1.1**
Product key No filter		**ESMD371L4TXA**	**ESMD751L4TXA**	**ESMD112L4TXA**
Mains voltage range	U_{Netz} [V]	3/PE AC 320 V -0% ... 528 V +0 %; 45 Hz -0% ... 65 Hz +0%		
Rated mains current Without mains choke	I_{Netz} [A]	1.6	3	4.3
Rated output current 8 kHz	I_N [A]	1.3	2.5	3.6
Max. output current 8 kHz [1]	I_{max} [A]	2	3.8	5.4
Power loss	P_V [W]	31	47	58
Dimensions				
Height	**H** [mm]		146	
Width	**B** [mm]		93	
Depth	**T** [mm]	100	120	146
Mass	**m** [kg]	0.6	0.8	1
Permissible motor cable length				
Shielded [2]	**l** [m]		50	
Unshielded [2]	**l** [m]		100	

[1] 60 s
[2] Permissible cable length may be affected if EMC conditions have to be met.

→ Dimensioned drawings
DS_MB_smd_0001
Available for download at www.lenze.de/dsc

Rated data

- The data is valid for operation at 3/PE AC 400 V.
- Unless otherwise specified, the data refers to the default setting with a switching frequency of 8 kHz.

→ Other rated data
DS_GD_smd_0001
Available for download at www.lenze.de/dsc

Motor power (asynchronous motor, 4-pole)	P_N [kW]	**1.5**	**2.2**	**3**	**4**
Product key No filter		**ESMD152L4TXA**	**ESMD222L4TXA**	**ESMD302L4TXA**	**ESMD402L4TXA**
Mains voltage range	U_{Netz} [V]	3/PE AC 320 V -0% ... 528 V +0 %; 45 Hz -0% ... 65 Hz +0%			
Rated mains current Without mains choke	I_{Netz} [A]	4.8	6.4	8.3	10.6
Rated output current 8 kHz	I_N [A]	4.1	5.8	7.6	9.4
Max. output current 8 kHz [1]	I_{max} [A]	6.2	8.7	11.4	14.1
Power loss	P_V [W]	63	92	121	155
Dimensions Height	**H** [mm]	146			
Width	**B** [mm]	114			
Depth	**T** [mm]	133		171	
Mass	**m** [kg]	1.4		1.7	1.8
Permissible motor cable length Shielded [2]	**l** [m]	50			
Unshielded [2]	**l** [m]	100			

[1] 60 s
[2] Permissible cable length may be affected if EMC conditions have to be met.

→ Dimensioned drawings
DS_MB_smd_0001
Available for download at www.lenze.de/dsc

Rated data

- The data is valid for operation at 3/PE AC 400 V.
- Unless otherwise specified, the data refers to the default setting with a switching frequency of 8 kHz.

→ Other rated data
DS_GD_smd_0001
Available for download at www.lenze.de/dsc

Motor power (asynchronous motor, 4-pole)	P_N [kW]	**5.5**	**7.5**	**11**
Product key No filter		**ESMD552L4TXA**	**ESMD752L4TXA**	**ESMD113L4TXA**
Mains voltage range	U_{Netz} [V]	3/PE AC 320 V -0% ... 528 V +0 %; 45 Hz -0% ... 65 Hz +0%		
Rated mains current Without mains choke	I_{Netz} [A]	14.2	18.1	27
Rated output current 8 kHz	I_N [A]	12.6	16.1	24
Max. output current 8 kHz [1]	I_{max} [A]	18.9	24	36
Power loss	P_V [W]	254	310	390
Dimensions Height	**H** [mm]	146	197	
Width	**B** [mm]	114	146	
Depth	**T** [mm]	171	182	
Mass	**m** [kg]	1.8	3.2	
Permissible motor cable length Shielded [2]	**l** [m]	50		
Unshielded [2]	**l** [m]	100		

[1] 60 s
[2] Permissible cable length may be affected if EMC conditions have to be met.

→ Dimensioned drawings
DS_MB_smd_0001
Available for download at www.lenze.de/dsc

Rated data

- The data is valid for operation at 3/PE AC 400 V.
- Unless otherwise specified, the data refers to the default setting with a switching frequency of 8 kHz.

→ Other rated data
DS_GD_smd_0001
Available for download at www.lenze.de/dsc

Motor power (asynchronous motor, 4-pole)	P_N [kW]	**15**	**18.5**	**22**
Product key No filter		**ESMD153L4TXA**	**ESMD183L4TXA**	**ESMD223L4TXA**
Mains voltage range	U_{Netz} [V]	3/PE AC 320 V -0% ... 528 V +0 %; 45 Hz -0% ... 65 Hz +0%		
Rated mains current Without mains choke	I_{Netz} [A]	35	44	52
Rated output current 8 kHz	I_N [A]	31	39	46
Max. output current 8 kHz [1]	I_{max} [A]	47	59	69
Power loss	P_V [W]	530	648	770
Dimensions				
Height	**H** [mm]	248		
Width	**B** [mm]	195		
Depth	**T** [mm]	203		
Mass	**m** [kg]	6.4		
Permissible motor cable length				
Shielded [2]	**l** [m]	50		
Unshielded [2]	**l** [m]	100		

[1] 60 s
[2] Permissible cable length may be affected if EMC conditions have to be met.

→ Dimensioned drawings
DS_MB_smd_0001
Available for download at www.lenze.de/dsc

Brake modules

An external brake resistor is needed to decelerate larger moments of inertia or in the event of longer operations in generator mode. It converts braking energy into heat.

- Brake modules and/or brake choppers are available for all smd with three-phase mains supply.
- A brake module is the combination of a brake chopper and a brake resistor in a housing

Motor power	Mains voltage	Product key		Brake module data			
(asynchronous motor, 4-pole)		Inverter	Brake module	Quantity	Resistance	Continuous power	Thermal capacity
P_N [kW]	U_{Netz} [V]				**R** [Ohm]	**P** [W]	**WK** [kWs]
0.37	3 AC 400/480	ESMD371L4TXA	ESMD3714RDB	1	1000	40	2
0.75		ESMD751L4TXA	ESMD1124RDB		500	80	4
1.1		ESMD112L4TXA					
1.5		ESMD152L4TXA	ESMD2224RDB		250	160	8
2.2		ESMD222L4TXA					
3		ESMD302L4TXA	ESMD4024RDB		167	360	18
4		ESMD402L4TXA					
5.5		ESMD552L4TXA	ESMD5524RDB		110		
7.5		ESMD752L4TXA	ESMD7524RDB		83	480	24

Motor power	Mains voltage	Product key		Brake module data	
(asynchronous motor, 4-pole)		Inverter	Brake module	Dimensions	Mass
P_N [kW]	U_{Netz} [V]			**H x B x T** [mm]	**m** [kg]
0.37	3 AC 400/480	ESMD371L4TXA	ESMD3714RDB	117 x 79 x 79	0.4
0.75		ESMD751L4TXA	ESMD1124RDB		0.5
1.1		ESMD112L4TXA			
1.5		ESMD152L4TXA	ESMD2224RDB	117 x 79 x 109	0.6
2.2		ESMD222L4TXA			
3		ESMD302L4TXA	ESMD4024RDB	117 x 79 x 142	0.7
4		ESMD402L4TXA			
5.5		ESMD552L4TXA	ESMD5524RDB	117 x 107 x 170	1
7.5		ESMD752L4TXA	ESMD7524RDB		1.1

→ Data sheet on brake module
DS_ZB_EMB_0001
Available for download at www.lenze.de/dsc

Brake choppers and brake resistors

An external brake resistor is needed to decelerate larger moments of inertia or in the event of longer operations in generator mode. It converts braking energy into heat.

- Brake modules and/or brake choppers are available for all smd with three-phase mains supply.

Motor power	Mains voltage	Product key			Brake resistor data			
(asynchronous motor, 4-pole)		Inverter	Brake chopper	Brake resistance	Quantity	Resistance	Continuous power	Thermal capacity
P_N [kW]	U_{Netz} [V]					**R** [Ohm]	**P** [W]	**WK** [kWs]
11	3 AC 400/480	ESMD113L4TXA	ESMD1834XDB	ESMD841-0093	1	47	880	44
15		ESMD153L4TXA						
18.5		ESMD183L4TXA		ESMD841-0113		31	1320	66
22		ESMD223L4TXA						

Motor power	Mains voltage	Product key			Brake resistor data	
(asynchronous motor, 4-pole)		Inverter	Brake chopper	Brake resistance	Dimensions	Mass
P_N [kW]	U_{Netz} [V]				**H x B x T** [mm]	**m** [kg]
11	3 AC 400/480	ESMD113L4TXA	ESMD1834XDB	ESMD841-0093	86 x 200 x 108	1.3
15		ESMD153L4TXA				
18.5		ESMD183L4TXA		ESMD841-0113	86 x 200 x 209	2
22		ESMD223L4TXA				

→ Data sheet on brake choppers
DS_ZB_EMB_0001
Available for download at www.lenze.de/dsc

→ Data sheet on brake resistors
DS_ZB_EBR_0001
Available for download at www.lenze.de/dsc

RFI filter

RFI filters are used to observe EMC requirements as stated in European standard EN 61800-3. This lays down EMC requirements for electric drive systems in various categories.
Category C1 applies in public networks (residential areas). In terms of limit values, category C1 corresponds to class B as laid down in EN 55011.
Category C2 applies in industrial premises, but also in residential areas if deemed appropriate by the user. In terms of limit values, category C2 corresponds to class A as laid down in EN 55011.

RFI filter

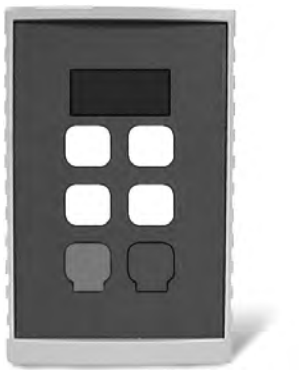
- RFI filters are available for all smd with three-phase mains supply (category C2 with max. 10 m of shielded motor cable)
- The filters are designed as footprint filters.
- Single-phase smd (ESMD□□□□2SFA types) are fitted with integrated RFI filters. (Category C2 with max. 10 m shielded motor cable).

Motor power	Mains voltage	Product key		RFI filter data				
(asynchronous motor, 4-pole)		Inverter	RFI filter	Rated current	Power loss	Max. cable length C1	Dimensions	Mass
P_N [kW]	U_{Netz} [V]			I_N [A]	P_v [W]	l [m]	H x B x T [mm]	m [kg]
0.37	3 AC 400/480	ESMD371L4TXA	FS21002-5-07	5	3	20	209 x 99 x 40	0.6
0.75		ESMD751L4TXA						
1.1		ESMD112L4TXA						
1.5		ESMD152L4TXA	FS21002-11-07	11	13	50	209 x 120 x 50	1
2.2		ESMD222L4TXA						
3		ESMD302L4TXA						
4		ESMD402L4TXA						
5.5		ESMD552L4TXA	FS21002-18-07	18	18	75		1.3
7.5		ESMD752L4TXA	FS21002-32-07	32	37	50	257 x 130 x 55	1.8
11		ESMD113L4TXA						
15		ESMD153L4TXA	FS21002-59-07	59	105	20	308 x 203 x 75	4
18.5		ESMD183L4TXA						
22		ESMD223L4TXA						

→ Data sheet on RFI filters
DS_ZB_EZF_0001
Available for download at www.lenze.de/dsc

External keypad

Keypad with IP65 degree of protection – for example for installation in a control cabinet door. The keypad has a panel of keys for the start/stop function, clockwise/counter-clockwise rotation, speed selection and an LED display. The keypad can be used with 400 V devices.



External keypad

Design	Product key
Keypad	ESMD01KP

EPM - Programming unit and memory chip

The EPM programmer allows configurations to be conveniently produced or edited offline. The device saves up to 30 different drive programs and is perfectly suited to copying processes. The complete frequency inverter configuration is stored on the pluggable memory chip. Simply replace the module and you can continue with another drive task right away.

EPM programmer and memory chips

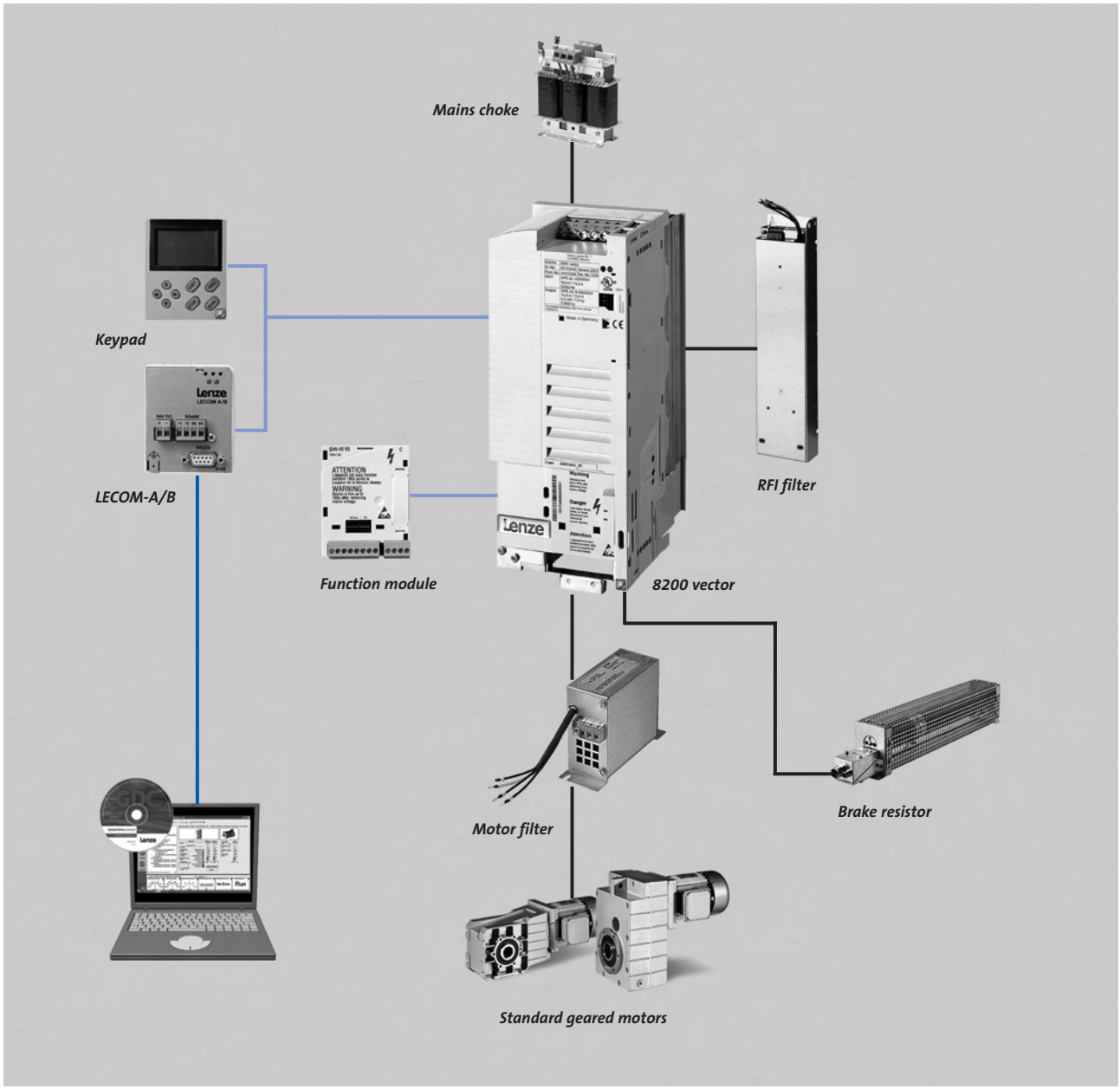
Design	Product key
EPM programmer	ESMD01EP
Pack of EPM memory chips	ESMD01BP

About this catalogue

This catalogue contains all frequency inverter components. The corresponding automation components can be found in the PC-based Automation catalogue.

For some components the "arrow" symbol appears together with an identifier printed in bold. This identifier can be retrieved directly in the electronic catalogue. The catalogue can be found online at:
www.lenze.de/dsc

Inverters and accessories



8200 vector – for standard applications

The concept of the 8200 vector frequency inverter is based on a modular system of components adjusted to each other. If combined with a Lenze geared motor or a Lenze three-phase AC motor, you can produce electronic variable speed drives for a wide range of applications in the 0.25 ... 90 kW power range.

The option of 'bookcase' mounting
permits a space-saving installation in the control cabinet. Installation costs are reduced using integrated filters (optional).

Flexible
The modular structure allows you to optimise the inverters to your application, making cost-effective drive solutions possible while maintaining high performance levels. Regardless of whether you opt for "stand alone“ inverters with potentiometer-based setpoint selection or inverters networked in a bus system – the functionality of the inverter can be adapted to your application.

Adaptable
The selectable form of the V/f characteristic allows the frequency inverters to be adapted to loads with torque requirements rising in a constant or quadratic manner. The integrated flying restart circuit means that a drive can be easily restarted when the shaft is still turning.

Energy-saving
The power level is adapted such that the inverter is only driven to suit the current demand for torque/power.

Immediately ready for operation
The frequency inverters are preset for standard use
Amongst other things, parameters are set for:

- controlled acceleration and deceleration using set acceleration and deceleration times
- assignment of inputs and outputs with standard functions.

Simple
This series of inverters are characterised by simple operability and handling while also offering high levels of functionality. A clear menu structure and user-guided commissioning thanks to the Global Drive Control easy (GDC easy) parameterisation software makes rapid frequency converter parameter setting and diagnostics possible. GDC easy is free of charge and can be downloaded from www.Lenze.de.

Clear
The XT keypad is also available for operation. Users can quickly access all inverter parameters in the clear menu structure using the 8 keys and a text display. The XT keypad is also used for status display, error diagnosis and, thanks to its integrated memory, for transferring settings to other inverters.

8200 vector – for standard applications

The right setpoint source for every requirement

- via setpoint potentiometer to the control terminals
- via master voltage or master current to the control terminals
- via digital frequency input
- via an operator module
- via a bus module from a host system

Communication-capable

In communication with a host system, inverters can be incorporated using plug-on bus modules. Virtually all common field bus systems are available (CAN, CANopen, PROFIBUS, INTERBUS, DeviceNet, AS interface and ETHERNET Powerlink).

Reliable

An adjustable slip compensation balances load-related speed variations without costly speed feedback. The maximum current limiting function ensures stable operation under static and dynamic loads. A PTC resistor can be connected to protect the motor.

Used around the world

Thanks to the huge mains voltage range of up to 500 V (+10%), you don't need to worry about where in the world your machine is supplied. And the 8200 vector series is of course certified in line with international standards .

Functions and features

Control modes/motor control	V/f control (linear or quadratic) Zero-sensor vector control
Basic functions	Freely assignable user menu 4 freely programmable parameter sets (can be swapped over online) Fault history buffer DC brake function Flying restart with coasting motor S-ramps for smooth acceleration Max. output frequency 650 Hz Fixed frequencies Masking frequencies PID controller Freely configurable inputs and outputs Level inversion
Monitoring and protective measures	Short circuit Earth fault Overvoltage Motor stalling Motor phase failure detection Load rejection/V-belt monitoring I^2 x t-Motor monitoring Motor overtemperature (input for PTC or thermal contact)
Diagnostics Status displays	2 LEDs
Braking operation Brake chopper Brake resistance	0.25 ... 11 kW integrated; 15 ... 90 kW external External

Control connections

The 8200 vector receives digital and analogue inputs and outputs through an I/O function module. These are used to control the inverter and/or incorporate it in automation and control concepts.

Communication with a host system can also be established and matched to the application using a plug-in communication module. This ensures great flexibility for various drive and automation tasks (bus and I/O mixed operation).

You can select from two I/O function modules:
- standard I/O PT for standard applications
- application I/O PT for challenging applications.

The function module is integrated on the bottom slot of the 8200 vector. There is a second slot for a bus-function module on the 8200 vector in the 15 to 90 kW power range. This allows the standard I/O PT to be combined with a bus function module; diagnostics with an operating module is for example possible at the same time.

Design	**8200 vector with standard I/O PT** [1]	**8200 vector with application I/O PT** [1]
Product key I/O function module	**E82ZAFSC010**	**E82ZAFAC010**
Inputs/outputs Analog inputs	▶ Quantity: 1 ▶ Voltage or current input (can be switched over) ▶ Resolution: 10 bits ▶ Value range: 0 ... +/-10 V, 0/4 ... 20 mA	▶ Quantity: 2 ▶ Voltage or current input (can be switched over) ▶ Resolution: 10 bits ▶ Value range: 0 ... +/-10 V, 0/4 ... 20 mA
Analog outputs	▶ Quantity: 1 ▶ Resolution: 10 bits ▶ Value range: 0 ... 10 V, max. 2 mA	▶ Number: 2, optional: voltage or current input ▶ Resolution: 10 bits Voltage: ▶ Value range: 0 ... 10 V, max. 2 mA Current: ▶ Value range: 0/4 ... 20 mA
Digital inputs	▶ Quantity: 5 ▶ Switching level: PLC (IEC 61131-2) ▶ 2 inputs, can optionally be used as a frequency input (10 kHz, 1-track)	▶ Quantity: 7 ▶ Switching level: PLC (IEC 61131-2) ▶ 2 inputs, can optionally be used as a frequency input (10 kHz, 2-track)
Digital outputs	▶ Quantity: 1 ▶ Switching level: PLC (IEC 61131-2) ▶ Max. output current: 50 mA	▶ Quantity: 2 ▶ Switching level: PLC (IEC 61131-2) ▶ Quantity: 1, frequency output (10 kHz, HTL) ▶ Max. output current: 8 A ▶ Max. output current: 50 A
Relay	▶ Quantity: 1 (15 ... 90 kW: 2) ▶ Contact: change-over ▶ AC connection: 250 V, 3 A ▶ DC connection: 24 V, 2 A	▶ Quantity: 1 (15 ... 90 kW: 2) ▶ Contact: change-over ▶ AC connection: 250 V, 3 A ▶ DC connection: 24 V, 2 A
Interfaces Extension modules	▶ Optional communication module ▶ Optional bus-function module (15 ... 90 kW)	▶ Optional communication module ▶ Optional bus-function module (15 ... 90 kW)

[1] The pluggable terminal strips of the function module ("PT" design) protrude around 15 mm out of the front of the inverter

→ Circuit diagrams
DS_SP_8200v_0001
Available for download at www.lenze.de/dsc

Standards and operating conditions

Conformity	CE: Low-Voltage Directive (2006/95/EC)
Approvals UL 508C	Power Conversion Equipment (file no. 132659)
Enclosure EN 60529 NEMA	IP20 Protection against contact according to NEMA 250 type 1
Climatic conditions Storage (EN 60721-3-1) Transport (EN 60721-3-2) Operation (EN 60721-3-3) Rated output current derating	0.25 ... 11 kW: 1K3 (temperature: -25 °C ... + 60 °C) 15 ... 90 kW: 1K3 (temperature: -25 °C ... + 55 °C) 2K3 (temperature: -25 °C ... + 70 °C) 0.25 ... 11 kW: 3K3 (temperature: -10 ...+ 55 °C) 15 ... 90 kW: 3K3 (temperature: 0 ...+ 50 °C) above + 40 °C by 2.5 %/°C
Permissible installation height Rated output current derating	0 ... 4000 m amsl Above 1000 m amsl by 5 %/1000 m
Vibration resistance	Acceleration resistant up to 0.7 g according to Germanischer Lloyd, general conditions

Permissible supply forms Unrestricted use	Systems with earthed star point (TN and TT systems) Networks with high-impedance or insulated star point (IT networks) with one variant (15 ... 90 kW)
Noise emission EN 61800-3	Conducted emissions, category C1 or C2 with shielded motor cable [1)] Depending on device version with integrated RFI measures or additional RFI and/or mains filter
Insulation resistance EN 61800-5-1	Overvoltage category III, more than 2000 m above sea level overvoltage category II
Pollution degree EN 61800-5-1	2
Protective insulation of control circuits EN 61800-5-1	Safe isolation of mains: double/reinforced insulation

[1)] Motor cable lengths depend on inverter type and switching frequency

Rated data

- The data is valid for operation at 1 /PE AC 230 V.
- Unless otherwise specified, the data refers to the default setting with a switching frequency of 8 kHz.

→ Other rated data, e.g. for operating with increased rated power
DS_GD_8200v_0001
Available for download at www.lenze.de/dsc

Motor power (asynchronous motor, 4-pole)	**P_N** [kW]	**0.25**	**0.37**
Product key Filter integrated [2] No filter		**E82EV251K2C** **E82EV251K2C200**	**E82EV371K2C** **E82EV371K2C200**
Mains voltage range	**U_{Netz}** [V]	1/N/PE AC 180 V -0% ... 264 V +0%; 45 Hz -0% ... 65 Hz +0%	
Alternative DC supply	**U_{DC}** [V]	Not possible	
Rated mains current Without mains choke With mains choke	 **I_{Netz}** [A] **I_{Netz}** [A]	 3.4 3	 5 4.2
Rated output current 8 kHz	**I_N** [A]	1.7	2.4
Max. output current 8 kHz [1]	**I_{max}** [A]	2.5	3.6
Brake chopper data Min. brake resistance	**R** [Ohm]	470	
Power loss	**P_V** [W]	30	40
Dimensions Height Width Depth	 **H** [mm] **B** [mm] **T** [mm]	 120 60 140	
Mass	**m** [kg]	0.8	
Permissible motor cable length Shielded [3] Unshielded [3]	 **l** [m] **l** [m]	 50 100	

[1] 60 s
[2] Max. 20 m motor cable (shielded) for category C2 according to EN 61800-3 (motor cable length for category C1 depends on inverter type and switching frequency)
[3] Permissible cable length may be affected if EMC conditions have to be met.

→ Dimensioned drawings
DS_MB_8200v_0001
Available for download at www.lenze.de/dsc

Rated data

- The data is valid for operation at 1/N/PE (3/PE) AC 230 V or DC 325 V.
- Unless otherwise specified, the data refers to the default setting with a switching frequency of 8 kHz.

→ Other rated data, e.g. for operating with increased rated power
DS_GD_8200v_0001
Available for download at www.lenze.de/dsc

Motor power (asynchronous motor, 4-pole)	P_N [kW]	**0.55**	**0.75**	**1.5**	**2.2**
Product key Filter integrated [2] No filter		**E82EV551K2C** **E82EV551K2C200**	**E82EV751K2C** **E82EV751K2C200**	**E82EV152K2C** **E82EV152K2C200**	**E82EV222K2C** **E82EV222K2C200**
Mains voltage range	U_{Netz} [V]	1/N/PE AC 180 V -0% ... 264 V +0%; 45 Hz -0% ... 65 Hz +0% 3/PE AC 100 V -0% ... 264 V +0%; 45 Hz -0% ... 65 Hz +0%			
Alternative DC supply	U_{DC} [V]	DC 140 V - 0 % ... 370 V + 0 %			
Rated mains current					
Without mains choke 1/N/PE	I_{Netz} [A]	6	9	15	[4]
With mains choke 1/N/PE	I_{Netz} [A]	5.6	7.5	12.5	18
Without mains choke 3/PE	I_{Netz} [A]	3.9	5.2	9.1	[4]
With mains choke 3/PE	I_{Netz} [A]	2.7	3.6	6.3	9
Rated output current 8 kHz	I_N [A]	3	4	7	9.5
Max. output current 8 kHz [1]	I_{max} [A]	4.5	6	10.5	14.2
Brake chopper data Min. brake resistance	**R** [Ohm]	90		47	
Power loss	P_V [W]	50	60	100	130
Dimensions					
Height	**H** [mm]	180		240	
Width	**B** [mm]	60			
Depth	**T** [mm]	140			
Mass	**m** [kg]	1.2		1.6	
Permissible motor cable length					
Shielded [3]	**l** [m]	50			
Unshielded [3]	**l** [m]	100			

[1] 60 s
[2] Max. 20 m motor cable (shielded) for category C2 according to EN 61800-3 (motor cable length for category C1 depends on inverter type and switching frequency)
[3] Permissible cable length may be affected if EMC conditions have to be met.
[4] Operation only permitted with mains choke

→ Dimensioned drawings
DS_MB_8200v_0001
Available for download at www.lenze.de/dsc

Rated data

- The data is valid for operation at 3/PE AC 230 V or DC 325 V.
- Unless otherwise specified, the data refers to the default setting with a switching frequency of 8 kHz.

→ Other rated data, e.g. for operating with increased rated power
DS_GD_8200v_0001
Available for download at www.lenze.de/dsc

Motor power (asynchronous motor, 4-pole)	P_N [kW]	**3**	**4**	**5.5**	**7.5**
Product key Filter integrated [2] No filter		**E82EV302K2C** **E82EV302K2C200**	**E82EV402K2C** **E82EV402K2C200**	**E82EV552K2C** **E82EV552K2C200**	**E82EV752K2C** **E82EV752K2C200**
Mains voltage range	U_{Netz} [V]	3/PE AC 100 V -0% ... 264 V +0%; 45 Hz -0% ... 65 Hz +0%			
Alternative DC supply	U_{DC} [V]	DC 140 V - 0 % ... 370 V + 0 %			
Rated mains current Without mains choke With mains choke	 I_{Netz} [A] I_{Netz} [A]	 15.6 12	 21.3 16	 29.3 21	 [4] 28
Rated output current 8 kHz	I_N [A]	12	16.5	22.5	28.6
Max. output current 8 kHz [1]	I_{max} [A]	18	24.8	33.8	42.9
Brake chopper data Min. brake resistance	**R** [Ohm]	29		19	
Power loss	P_V [W]	150	190	250	320
Dimensions Height Width Depth	 **H** [mm] **B** [mm] **T** [mm]	 240 100 140		 125 	
Mass	**m** [kg]	2.9		3.6	
Permissible motor cable length Shielded [3] Unshielded [3]	 **l** [m] **l** [m]	 50 100			

[1] 60 s
[2] Max. 20 m motor cable (shielded) for category C2 according to EN 61800-3 (motor cable length for category C1 depends on inverter type and switching frequency)
[3] Permissible cable length may be affected if EMC conditions have to be met.
[4] Operation only permitted with mains choke

→ Dimensioned drawings
DS_MB_8200v_0001
Available for download at www.lenze.de/dsc

Rated data

- The data is valid for operation at 3/PE AC 400 V.
- Unless otherwise specified, the data refers to the default setting with a switching frequency of 8 kHz.

→ Other rated data, e.g. for operating with increased rated power
DS_GD_8200v_0001
Available for download at www.lenze.de/dsc

Motor power (asynchronous motor, 4-pole)	**P_N** [kW]	**0.55**	**0.75**	**1.5**	**2.2**
Product key Filter integrated [2] No filter		**E82EV551K4C** **E82EV551K4C200**	**E82EV751K4C** **E82EV751K4C200**	**E82EV152K4C** **E82EV152K4C200**	**E82EV222K4C** **E82EV222K4C200**
Mains voltage range	**U_{Netz}** [V]	3/PE AC 320 V-0 % ... 550 V+0 %; 45 Hz-0 % ... 65 Hz+0 %			
Alternative DC supply	**U_{DC}** [V]	DC 450 V-0 % ... 775 V+0 %			
Rated mains current Without mains choke With mains choke	 **I_{Netz}** [A] **I_{Netz}** [A]	 2.5 2	 3.3 2.3	 5.5 3.9	 7.3 5.1
Rated output current 8 kHz	**I_N** [A]	1.8	2.4	3.9	5.6
Max. output current 8 kHz [1]	**I_{max}** [A]	2.7	3.6	5.9	8.4
Brake chopper data Min. brake resistance	**R** [Ohm]	455		230	155
Power loss	**P_V** [W]	50	60	100	130
Dimensions Height Width Depth	 **H** [mm] **B** [mm] **T** [mm]	 180 60 140		 240	
Mass	**m** [kg]	1.2		1.6	
Permissible motor cable length Shielded [3] Unshielded [3]	 **l** [m] **l** [m]	 50 100			

[1] 60 s
[2] Max. 20 m motor cable (shielded) for category C2 according to EN 61800-3 (motor cable length for category C1 depends on inverter type and switching frequency)
[3] Permissible cable length may be affected if EMC conditions have to be met.

→ Dimensioned drawings
DS_MB_8200v_0001
Available for download at www.lenze.de/dsc

Rated data

- The data is valid for operation at 3/PE AC 400 V.
- Unless otherwise specified, the data refers to the default setting with a switching frequency of 8 kHz.

→ Other rated data, e.g. for operating with increased rated power
DS_GD_8200v_0001
Available for download at www.lenze.de/dsc

Motor power (asynchronous motor, 4-pole)	P_N [kW]	**3**	**4**	**5.5**
Product key Filter integrated [2] No filter		**E82EV302K4C** **E82EV302K4C200**	**E82EV402K4C** **E82EV402K4C200**	**E82EV552K4C** **E82EV552K4C200**
Mains voltage range	U_{Netz} [V]	3/PE AC 320 V-0 % ... 550 V+0 %; 45 Hz-0 % ... 65 Hz+0 %		
Alternative DC supply	U_{DC} [V]	DC 450 V-0 % ... 775 V+0 %		
Rated mains current Without mains choke With mains choke	 I_{Netz} [A] I_{Netz} [A]	 9 7	 12.3 8.8	 16.8 12
Rated output current 8 kHz	I_N [A]	7.3	9.5	13
Max. output current 8 kHz [1]	I_{max} [A]	11	14.2	19.5
Brake chopper data Min. brake resistance	**R** [Ohm]	100		68
Power loss	P_V [W]	145	180	230
Dimensions Height Width Depth	 **H** [mm] **B** [mm] **T** [mm]	 240 100 140		
Mass	**m** [kg]	2.9		
Permissible motor cable length Shielded [3] Unshielded [3]	 **l** [m] **l** [m]	 50 100		

[1] 60 s
[2] Max. 20 m motor cable (shielded) for category C2 according to EN 61800-3 (motor cable length for category C1 depends on inverter type and switching frequency)
[3] Permissible cable length may be affected if EMC conditions have to be met.

→ Dimensioned drawings
DS_MB_8200v_0001
Available for download at www.lenze.de/dsc

Rated data

- The data is valid for operation at 3/PE AC 400 V.
- Unless otherwise specified, the data refers to the default setting with a switching frequency of 8 kHz.

→ Other rated data, e.g. for operating with increased rated power
DS_GD_8200v_0001
Available for download at www.lenze.de/dsc

Motor power (asynchronous motor, 4-pole)	P_N [kW]	**7.5**	**11**
Product key Filter integrated [2] No filter		**E82EV752K4C** **E82EV752K4C200**	**E82EV113K4C** **E82EV113K4C200**
Mains voltage range	U_{Netz} [V]	3/PE AC 320 V-0 % ... 550 V+0 %; 45 Hz-0 % ... 65 Hz+0 %	
Alternative DC supply	U_{DC} [V]	DC 450 V-0 % ... 775 V+0 %	
Rated mains current Without mains choke With mains choke	 I_{Netz} [A] I_{Netz} [A]	 21.5 15	 [3] 21
Rated output current 8 kHz	I_N [A]	16.5	23.5
Max. output current 8 kHz [1]	I_{max} [A]	24.8	35.3
Brake chopper data Min. brake resistance	**R** [Ohm]	47	33
Power loss	P_V [W]	300	410
Dimensions Height Width Depth	 **H** [mm] **B** [mm] **T** [mm]	 240 125 140	
Mass	**m** [kg]	3.6	
Permissible motor cable length Shielded [4] Unshielded [4]	 **l** [m] **l** [m]	 50 100	

[1] 60 s
[2] Max. 20 m motor cable (shielded) for category C2 according to EN 61800-3 (motor cable length for category C1 depends on inverter type and switching frequency)
[3] Operation only permitted with mains choke
[4] Permissible cable length may be affected if EMC conditions have to be met.

→ Dimensioned drawings
DS_MB_8200v_0001
Available for download at www.lenze.de/dsc

Rated data

- The data is valid for operation at 3/PE AC 400 V.
- Unless otherwise specified, the data refers to the default setting with a switching frequency of 8 kHz.

→ Other rated data, e.g. for operating with increased rated power
DS_GD_8200v_0001
Available for download at www.lenze.de/dsc

Motor power (asynchronous motor, 4-pole)	P_N [kW]	**15**	**22**	**30**
Product key Without mains filter		**E82EV153K4B201**	**E82EV223K4B201**	**E82EV303K4B201**
Mains voltage range	U_{Netz} [V]	3/PE AC 320 V-0 % ... 550 V+0 %; 45 Hz-0 % ... 65 Hz+0 %		
Rated mains current Without mains choke	I_{Netz} [A]	43.5	[2]	
With mains choke	I_{Netz} [A]	29	42	55
Rated output current 8 kHz	I_N [A]	32	47	59
Max. output current 8 kHz [1]	I_{max} [A]	48	70.5	89
Power loss	P_V [W]	430	640	810
Dimensions Height	**H** [mm]	350		
Width	**B** [mm]	250		
Depth	**T** [mm]	250		
Mass	**m** [kg]	15		
Permissible motor cable length Shielded [3]	**l** [m]	50		
Unshielded [3]	**l** [m]	100		

[1] 60 s
[2] Operation only permitted with mains choke or mains filter
[3] Permissible cable length may be affected if EMC conditions have to be met.

→ Dimensioned drawings
DS_MB_8200v_0001
Available for download at www.lenze.de/dsc

Rated data

- The data is valid for operation at 3/PE AC 400 V.
- Unless otherwise specified, the data refers to the default setting with a switching frequency of 8 kHz.

→ Other rated data, e.g. for operating with increased rated power
DS_GD_8200v_0001
Available for download at www.lenze.de/dsc

Motor power (asynchronous motor, 4-pole)	P_N [kW]	**45**	**55**	**75**	**90**
Product key Without mains filter		**E82EV453K4B201**	**E82EV553K4B201**	**E82EV753K4B201**	**E82EV903K4B201**
Mains voltage range	U_{Netz} [V]	3/PE AC 320 V-0 % ... 550 V+0 %; 45 Hz-0 % ... 65 Hz+0 %			
Rated mains current Without mains choke	I_{Netz} [A]			[2]	
With mains choke	I_{Netz} [A]	80	100	135	165
Rated output current 8 kHz	I_N [A]	89	110	150	171
Max. output current 8 kHz [1]	I_{max} [A]	134	165	225	221
Power loss	P_V [W]	1100	1470	1960	2400
Dimensions Height	**H** [mm]	510	591	680	
Width	**B** [mm]	340		450	
Depth	**T** [mm]	285			
Mass	**m** [kg]	34	37	59	
Permissible motor cable length Shielded [3]	**l** [m]	50			
Unshielded [3]	**l** [m]	100			

[1] 60 s
[2] Operation only permitted with mains choke or mains filter
[3] Permissible cable length may be affected if EMC conditions have to be met.

→ Dimensioned drawings
DS_MB_8200v_0001
Available for download at www.lenze.de/dsc

Brake choppers and brake resistors

An external brake resistor is needed to decelerate larger moments of inertia or in the event of longer operations in generator mode. It converts braking energy into heat.
The brake resistors recommended in the table are designed for around 1.5 times the regenerative power for a cycle time of 15/135 s (brake/pause). The brake resistors are fitted with a thermostat (potential-free NC contact).

- The ERBD... brake resistors are tested according to UR

Brake resistance ERBM...(IP20)

Motor power	Mains voltage	Product key				Brake resistor data			
(asynchronous motor, 4-pole)		Inverter	Brake chopper	Quantity	Brake resistance	Quantity	Resistance	Continuous power	Thermal capacity
P_N [kW]	U_{Netz} [V]						R [Ohm]	P [W]	WK [kWs]
0.25	1 AC 230/240	E82EV251K2C	Integrated		ERBM470R020W	1	470	20	3
0.37		E82EV371K2C							
0.55	1 AC 230/240	E82EV551K2C			ERBM200R100W		200	100	15
0.75		E82EV751K2C							
1.5	3 AC 230/240	E82EV152K2C			ERBM082R150W		82	150	22.5
2.2		E82EV222K2C			ERBM052R200W		52	200	30
3	3 AC 230/240	E82EV302K2C			ERBD047R01K2		47	1200	174
4		E82EV402K2C							
5.5		E82EV552K2C							
7.5		E82EV752K2C							
0.55	3 AC 400/500	E82EV551K4C			ERBM470R100W		470	100	15
0.75		E82EV751K4C							
1.5		E82EV152K4C			ERBM370R150W		370	150	22.5
2.2		E82EV222K4C			ERBM240R200W		240	200	30
3		E82EV302K4C			ERBD180R300W		180	300	45
4		E82EV402K4C			ERBD100R600W		100	600	83
5.5		E82EV552K4C			ERBD082R600W		82		87
7.5		E82EV752K4C			ERBD068R800W		68	800	120
11		E82EV113K4C			ERBD047R01K2		47	1200	174
15		E82EV153K4B	EMB9352-E	1	ERBD033R02K0	2	33	2000	240
22		E82EV223K4B							
30		E82EV303K4B		2					
45		E82EV453K4B							
55		E82EV553K4B							
75		E82EV753K4B		3		3			
90		E82EV903K4B		4		4			

→ Data sheet on ERBD brake resistors
DS_ZB_ERBP_0001
Available for download at www.lenze.de/dsc

→ Data sheet on ERBM brake resistors
DS_ZB_ERBM_0001
Available for download at www.lenze.de/dsc

→ Data sheet on brake choppers
DS_ZB_EMB_0001
Available for download at www.lenze.de/dsc

Brake choppers and brake resistors

Motor power	Mains voltage	Product key			Brake resistor data	
(asyn-chronous motor, 4-pole)		Inverter	Brake chopper	Brake resistance	Dimensions	Mass
P_N [kW]	U_{Netz} [V]				**H x B x T** [mm]	**m** [kg]
0.25	1 AC 230/240	E82EV251K2C	Integrated	ERBM470R020W	160 x 45 x 36	0.3
0.37		E82EV371K2C				
0.55	1 AC 230/240 3 AC 230/240	E82EV551K2C		ERBM200R100W	160 x 80 x 95	0.6
0.75		E82EV751K2C				
1.5		E82EV152K2C		ERBM082R150W	240 x 80 x 95	1
2.2		E82EV222K2C		ERBM052R200W	340 x 80 x 66	1.3
3	3 AC 230/240	E82EV302K2C		ERBD047R01K2	639 x 172 x 142	4.9
4		E82EV402K2C				
5.5		E82EV552K2C				
7.5		E82EV752K2C				
0.55	3 AC 400/500	E82EV551K4C		ERBM470R100W	240 x 70 x 59	0.8
0.75		E82EV751K4C				
1.5		E82EV152K4C		ERBM370R150W	240 x 80 x 95	1
2.2		E82EV222K4C		ERBM240R200W	340 x 80 x 66	1.3
3		E82EV302K4C		ERBD180R300W	439 x 64 x 142	2
4		E82EV402K4C		ERBD100R600W	639 x 64 x 142	3.1
5.5		E82EV552K4C		ERBD082R600W		
7.5		E82EV752K4C		ERBD068R800W	539 x 172 x 142	4.3
11		E82EV113K4C		ERBD047R01K2	639 x 172 x 142	4.9
15		E82EV153K4B	EMB9352-E	ERBD033R02K0	639 x 262 x 142	7.1
22		E82EV223K4B		ERBD022R03K0	739 x 172 x 247	10.6
30		E82EV303K4B		ERBD018R03K0		
45		E82EV453K4B		ERBD022R03K0		
55		E82EV553K4B		ERBD018R03K0		
75		E82EV753K4B		ERBD022R03K0		
90		E82EV903K4B		ERBD018R03K0		

→ Data sheet on brake choppers
DS_ZB_EMB_0001
Available for download at www.lenze.de/dsc

→ Data sheet on brake resistors
DS_ZB_EBR_0001
Available for download at www.lenze.de/dsc

Mains chokes

A mains choke is an inductance which is switched in the inverter's mains cable. Using a mains choke delivers the following benefits:

- **less system perturbation:**
  the curved shape of the mains current approaches a sine shape.
- **reduction in effective mains current:**
  reduction in mains, cable and fuse load.

There are no limitations on using a mains choke together with RFI filters and/or motor filters.

Please note:

- when using a mains choke, the mains voltage on the inverter input is reduced slightly – typical voltage drop on the mains choke at the rated point approx. 5%.
- A mains choke or mains filter always has to be used for some inverters because otherwise the permissible rated data for the components used may be exceeded as a result of excess mains currents.
- The following assignment applies to operation with rated power.

Motor power	Mains voltage	Product key		Mains choke data		
(asynchronous motor, 4-pole)		Inverter	Mains choke	Rated current	Dimensions	Mass
P_N [kW]	U_{Netz} [V]			I_N [A]	H x B x T [mm]	m [kg]
0.25	1 AC 230/240	E82EV251K2C	ELN1-0900H005	5	80 x 66 x 67	2.3
0.37		E82EV371K2C				
0.55	1 AC 230/240 3 AC 230/240	E82EV551K2C	ELN1-0500H009	9		1
			EZN3A1500H003	3	155 x 95 x 82	1.1
0.75		E82EV751K2C	ELN1-0500H009	9	80 x 66 x 67	1
			EZN3A1500H003	3	155 x 95 x 82	1.1
1.5		E82EV152K2C	ELN1-0250H018	18	120 x 108 x 103	2.3
			E82ZL22234B	6.1	120 x 61 x 126	2
2.2		E82EV222K2C [1]	ELN1-0250H018	18	120 x 108 x 103	2.3
			E82ZL22234B	6.1	120 x 61 x 126	2
3	3 AC 230/240	E82EV302K2C	ELN3-0120H017	17	120 x 65 x 162	3
4		E82EV402K2C				
5.5		E82EV552K2C	ELN3-0120H025	25	150 x 100 x 185	5.7
7.5		E82EV752K2C [1]	ELN3-0088H035	35	180 x 125 x 225	9.8
0.55	3 AC 400/500	E82EV551K4C	EZN3A1500H003	3	155 x 95 x 82	1.1
0.75		E82EV751K4C				
1.5		E82EV152K4C	E82ZL22234B	6.1	120 x 61 x 126	2
2.2		E82EV222K4C				
3		E82EV302K4C	EZN3A0500H007	7	138 x 119 x 95	2.5
4		E82EV402K4C	EZN3A0300H013	13	162 x 150 x 106	5.2
5.5		E82EV552K4C				
7.5		E82EV752K4C	ELN3-0120H017	17	120 x 65 x 162	3
11		E82EV113K4C [1]	ELN3-0150H024	24	180 x 86 x 192	8
15		E82EV153K4B	ELN3-0088H035	35	180 x 125 x 225	9.8
22		E82EV223K4B [1]	ELN3-0075H045	45		10.1
30		E82EV303K4B [1]	ELN3-0055H055	55	228 x 120 x 265	13
45		E82EV453K4B [1]	ELN3-0038H085	85	228 x 111 x 263	19.5
55		E82EV553K4B [1]	ELN3-0027H105	105	228 x 155 x 265	20.2
75		E82EV753K4B [1]	ELN3-0022H130	130	264 x 135 x 265	21.4
90		E82EV903K4B [1]	ELN3-0017H170	170	265 x 170 x 268	30.3

[1] Operation only permitted with mains choke or mains filter

→ Data sheet on mains chokes
DS_ZB_ELN_0001
Available for download at www.lenze.de/dsc

→ Data sheet for mains chokes for operating with increased rated power
DS_ZB_ELN_0002
Available for download at www.lenze.de/dsc

RFI filter

RFI filters are used to observe EMC requirements as stated in European standard EN 61800-3. This lays down EMC requirements for electric drive systems in various categories.
Category C1 applies in public networks (residential areas). In terms of limit values, category C1 corresponds to class B as laid down in EN 55011.
Category C2 applies in industrial premises, but also in residential areas if deemed appropriate by the user. In terms of limit values, category C2 corresponds to class A as laid down in EN 55011.

RFI filter

The 8200 vector with integrated RFI measures satisfies the standard EMC requirements. In the event of more stringent requirements of the noise emission, which cannot be achieved with the RFI measures integrated in the inverter, external filters can be used in the power range of up to 11 kW.

- Important: only use RFI filters in combination with 8200 vector without integrated filters! (E82EV□□□K□C200)
- The motor cable lengths stated are maximum values and depend on the inverter type and switching frequency.

Three different filter types are available:

- LL (Low Leakage) RFI filter with a discharge current < 3.5 mA over 5 m of shielded motor cable allows for installation in portable systems
  (category C1 with 5 m of shielded motor cable).
- SD (Short Distance) RFI filter with low discharge current, e.g. for operation on a 30 mA earth-leakage circuit-breaker with 10 m of shielded motor cable (guide value) (category C1 with 20 m of shielded motor cable, category C2 with 20 m of shielded motor cable)
- LD (Long Distance) RFI filter for operation with long motor cables
  (category C1 with 50 m of shielded motor cable, category C2 with 50 m of shielded motor cable).
  The LD RFI filter and motor filter combination ensures compliance with category C1 with 100 m of shielded motor cable.

→ Data sheet on RFI filters
DS_ZB_EZF_0001
Available for download at www.lenze.de/dsc

RFI filter

Motor power	Mains voltage	Product key		RFI filter data			
(asynchronous motor, 4-pole)		Inverter	RFI filter	Design	Rated current	Dimensions	Mass
P_N [kW]	U_{Netz} [V]				I_N [A]	H x B x T [mm]	m [kg]
0.25	1 AC 230/240	E82EV251K2C200	E82ZZ37112B200 E82ZZ37112B210 E82ZZ37112B220	SD LD LL	3.1 3.1 3.1	217 x 60 x 30 217 x 60 x 30 217 x 60 x 30	0.5 0.5 0.5
0.37	1 AC 230/240	E82EV371K2C200	E82ZZ37112B200 E82ZZ37112B210 E82ZZ37112B220	SD LD LL	3.1 3.1 3.1	217 x 60 x 30 217 x 60 x 30 217 x 60 x 30	0.5 0.5 0.5
0.55	1 AC 230/240 3 AC 230/240	E82EV551K2C200	E82ZZ75112B200 E82ZZ75112B210 E82ZZ75112B220 E82ZZ75132B200 E82ZZ75132B210	SD LD LL SD LD	5.9 5.9 5.9 3.4 3.4	277 x 60 x 40 277 x 60 x 40 277 x 60 x 40 277 x 60 x 40 277 x 60 x 40	0.8 0.8 0.8 0.8 0.8
0.75	1 AC 230/240 3 AC 230/240	E82EV751K2C200	E82ZZ75112B200 E82ZZ75112B210 E82ZZ75112B220 E82ZZ75132B200 E82ZZ75132B210	SD LD LL SD LD	5.9 5.9 5.9 3.4 3.4	277 x 60 x 40 277 x 60 x 40 277 x 60 x 40 277 x 60 x 40 277 x 60 x 40	0.8 0.8 0.8 0.8 0.8
1.5	1 AC 230/240 3 AC 230/240	E82EV152K2C200	E82ZZ22212B200 E82ZZ22212B210 E82ZZ22232B200 E82ZZ22232B210	SD LD SD LD	11.2 11.2 7.8 7.8	337 x 60 x 40 337 x 60 x 40 337 x 60 x 40 337 x 60 x 40	0.9 0.9 0.8 0.8
2.2	1 AC 230/240 3 AC 230/240	E82EV222K2C200	E82ZZ22212B200 E82ZZ22212B210 E82ZZ22232B200 E82ZZ22232B210	SD LD SD LD	11.2 11.2 7.8 7.8	337 x 60 x 40 337 x 60 x 40 337 x 60 x 40 337 x 60 x 40	0.9 0.9 0.8 0.8
3	3 AC 230/240	E82EV302K2C200	E82ZZ40232B200 E82ZZ40232B210	SD LD	13.7 13.7	337 x 100 x 60 337 x 100 x 60	1.7 1.7
4	3 AC 230/240	E82EV402K2C200	E82ZZ40232B200 E82ZZ40232B210	SD LD	13.7 13.7	337 x 100 x 60 337 x 100 x 60	1.7 1.7
5.5	3 AC 230/240	E82EV552K2C200	E82ZZ75232B200 E82ZZ75232B210	SD LD	18.7 18.7	337 x 125 x 60 337 x 125 x 60	2.1 2.1
7.5	3 AC 230/240	E82EV752K2C200	E82ZZ75232B200 E82ZZ75232B210	SD LD	18.7 18.7	337 x 125 x 60 337 x 125 x 60	2.1 2.1
0.55	3 AC 400/500	E82EV551K4C200	E82ZZ75134B200 E82ZZ75134B210	SD LD	2.1 2.1	277 x 60 x 40 277 x 60 x 40	1.7 1.7
0.75	3 AC 400/500	E82EV751K4C200	E82ZZ75134B200 E82ZZ75134B210	SD LD	2.1 2.1	277 x 60 x 40 277 x 60 x 40	1.7 1.7
1.5	3 AC 400/500	E82EV152K4C200	E82ZZ22234B200 E82ZZ22234B210	SD LD	4.5 4.5	337 x 60 x 40 337 x 60 x 40	0.9 0.9
2.2	3 AC 400/500	E82EV222K4C200	E82ZZ22234B200 E82ZZ22234B210	SD LD	4.5 4.5	337 x 60 x 40 337 x 60 x 40	0.9 0.9
3	3 AC 400/500	E82EV302K4C200	E82ZZ55234B200 E82ZZ55234B210	SD LD	10.5 10.5	337 x 100 x 60 337 x 100 x 60	1.7 1.7
4	3 AC 400/500	E82EV402K4C200	E82ZZ55234B200 E82ZZ55234B210	SD LD	10.5 10.5	337 x 100 x 60 337 x 100 x 60	1.7 1.7
5.5	3 AC 400/500	E82EV552K4C200	E82ZZ55234B200 E82ZZ55234B210	SD LD	10.5 10.5	337 x 100 x 60 337 x 100 x 60	1.7 1.7
7.5	3 AC 400/500	E82EV752K4C200	E82ZZ11334B200 E82ZZ11334B210	SD LD	13.1 13.1	337 x 125 x 60 337 x 125 x 60	2.1 2.1
11	3 AC 400/500	E82EV113K4C200	E82ZZ11334B200 E82ZZ11334B210	SD LD	13.1 13.1	337 x 125 x 60 337 x 125 x 60	2.1 2.1

Mains filter

A mains filter is a mains choke and RFI filter combination in a housing. It is used to comply with category C1 (with 10m of shielded motor cable) and C2 (with 50m of shielded motor cable) according to EN 61800-3.

- Important: Only use the mains filter in combination with E82EV□□□K4B2□1 type 8200 vectors! The 8200 vector frequency inverter is also available with a fully fitted mains filter (types: E82EV□□□K4B3□□).
- The filters are designed as footprint filters.
- Built-on mains filters are also available (category C1 with 50 m of shielded motor cable)
- When mounting the inverter in cold plate technology, only built-on mains filters can be used for interference suppression.
- The motor cable lengths stated are maximum values and depend on the inverter type and switching frequency.
- The following assignment applies to operation with rated power.

Furthermore, a mains filter achieves the efficiency of a mains choke which also reduces the r.m.s. value of the mains current. Mains filters are available in a power range of 15 ... 90 kW.

Motor power	Mains voltage	Product key		Mains filter data		
(asynchronous motor, 4-pole)		Inverter	Mains filter	Rated current	Dimensions	Mass
P_N [kW]	U_{Netz} [V]			I_N [A]	H x B x T [mm]	m [kg]
15	3 AC 400/500	E82EV153K4B201	E82ZN22334B230	42	410 x 236 x 110	13
22		E82EV223K4B201				
30		E82EV303K4B201	E82ZN30334B230	55		19
45		E82EV453K4B201	E82ZN45334B230	80	580 x 318 x 114	26
55		E82EV553K4B201	E82ZN55334B230	100	685 x 318 x 114	29
75		E82EV753K4B201	E82ZN75334B230	135	760 x 428 x 114	53
90		E82EV903K4B201	E82ZN90334B230	165	765 x 428 x 114	90

→ Data sheet on mains filters
DS_ZB_EZN_0001
Available for download at www.lenze.de/dsc

→ Data sheet for mains filter for operating with increased rated power
DS_ZB_EZN_0003
Available for download at www.lenze.de/dsc

→ Assignment of built-on mains filter
DS_ZB_EZN_0002
Available for download at www.lenze.de/dsc

Motor filter

You use motor filters to reduce the load on the motor winding and to reduce capacitive charge/discharge currents with long motor cables. Motor filters ensure reliable drive operations with up to 100 m of shielded or 200 m of unshielded motor cable.

- Motor filters combined with a "Long Distance" RFI filter allow category C1 to be observed with a motor cable of up to 100 m and category C2 with a motor cable of up to 200 m in the 0.25 to 11 kW power range.
- The voltage drop on the motor filter with rated current and a frequency of 50 Hz is typically around 3% of the max. output voltage of the inverter.
- Observe the operating conditions of the motor filter.

Motor filter

A motor filter is needed:

- as of 50 m of shielded or 100 m of unshielded motor cable (regardless of observance of EMC requirements)
- When using motors whose insulation systems are not suitable for inverter operation.

Motor power	Mains voltage	Product key		Motor filter data		
(asynchronous motor, 4-pole)		Inverter	Motor filter	Rated current	Dimensions	Mass
P_N [kW]	U_{Netz} [V]			I_N [A]	H x B x T	
0.25	1 AC 230/240	E82EV251K2C	E82ZM22232B	1.7	220 x 60 x 140	3.6
0.37		E82EV371K2C		2.4		
0.55	1 AC 230/240	E82EV551K2C		3		
0.75		E82EV751K2C		4		
1.5	3 AC 230/240	E82EV152K2C		7		
2.2		E82EV222K2C		9.5		
3	3 AC 230/240	E82EV302K2C	E82ZM75234B	12	300 x 127 x 150	5.4
4		E82EV402K2C		16.5		
5.5		E82EV552K2C	E82ZM11334B	22.5	295 x 161 x 240	9.5
7.5		E82EV752K2C		28.6		
0.55	3 AC 400/500	E82EV551K4C	E82ZM75134B	1.8	200 x 67 x 130	2.2
0.75		E82EV751K4C		2.4		
1.5		E82EV152K4C	E82ZM22234B020	3.9		2.3
2.2		E82EV222K4C		5.6		
3		E82EV302K4C	E82ZM40234B	7.3	270 x 106 x 150	3.6
4		E82EV402K4C		9.5		
5.5		E82EV552K4C	E82ZM75234B	13	300 x 127 x 150	5.4
7.5		E82EV752K4C		16.5		
11		E82EV113K4C	E82ZM11334B	23.5	295 x 161 x 240	9.5
15		E82EV153K4B	ELM3-004H055	32	500 x 235 x 185	40
22		E82EV223K4B		47		

→ Data sheet on motor filters
DS_ ZB_M_0001
Available for download at www.lenze.de/dsc

→ Data sheet for motor filters for operating with increased rated power
DS_ZB_ELM_0002
Available for download at www.lenze.de/dsc

Keypad and diagnosis terminal

The keypad is provided to visualise the operating parameters and set parameters for the inverter. The keypad is plugged onto the front of the inverter and is also used for the status display, error diagnosis and, with integrated memory, to transfer parameters to other inverters.

Diagnosis terminal with XT keypad and connection cable

As an alternative, diagnosis terminals with integrated keypads are available for visualising the operating parameters and inverter parameter setting

Design		Features	Slot	Product key
		Keypads and accessories		
Keypad XT		▶ Password protection ▶ Plain text display ▶ Predefined basic configurations ▶ User-specific menus ▶ Suitable for the 8200 vector and 9300 inverters series ▶ IP20 degree of protection	AIF	EMZ9371BC
Diagnosis terminal with XT keypad		▶ Diagnosis terminal complete with XT keypad (EMZ9371BC) ▶ Suitable for the 8200 and 9300 inverters series ▶ IP20 degree of protection		E82ZBBXC
Keypad		▶ Password protection ▶ Suitable for installation in control cabinet ▶ Suitable for 8200 inverter series ▶ IP55 degree of protection		E82ZBC
Diagnosis terminal with keypad		▶ Diagnosis terminal complete with keypad (E82ZBC) ▶ Suitable for 8200 inveter series ▶ IP55 degree of protection		E82ZBB
Assembly kit [2]		▶ Installation kit for control cabinet (for E82ZBC keypad)		E82ZBHT
Connection cable [1]		▶ Connection cable, 2.5 m		E82ZWL025
		▶ Connection cable, 5 m		E82ZWL050
		▶ Connection cable, 10 m		E82ZWL100

[1] Required for use of diagnosis terminal or control cabinet installation kit.
[2] Needed when installing keypad in a control cabinet door.

PC interface (RS232)

Using a PC and the LECOM-A (RS232) communication module, the inverter can be operated and diagnosed (as an alternative to using a keypad) via the convenient and free of charge "Global Drive Control easy" parameter setting / operating software. A PC system cable is used to link to the PC.

PC interface (RS232)

Design		Features	Slot	Product key
LECOM-A communication module		▶ 3 LED for communication status display ▶ RS 232 ▶ Electrically isolated from the bus ▶ No external voltage supply required	AIF	EMF2102IBCV004
PC system cable		▶ PC system cable 0.5 m		EWL0048
		▶ PC system cable 5 m		EWL0020
		▶ PC system cable 10 m		EWL0021

→ Data sheet on PC interface (RS232)
DS_ZB_EMF_0001
Available for download at www.lenze.de/dsc

PC system bus adapter

Alternatively in a CAN network, operation and diagnostics with the PC can also be undertaken using an inverter CAN interface. The PC system bus adapter is plugged onto the PC's parallel interface or USB connection. The corresponding drivers are installed automatically. Depending on version, the adapter's voltage supply comes via the PC's DIN connection, PS2 connection or USB connection.

EMF2173IBV003 adapter

Advantage:

- operation, parameter setting and diagnostics in parallel to plugged keypad
- Several inverters can be addressed from one point in networked systems (remote parameterisation)

Design	Features	Product key
PC system bus adapter	► Voltage supply via DIN connection on PC	EMF2173IB
	► Voltage supply via PS2 connection on PC	EMF2173IBV002
	► Voltage supply via PS2 connection on PC ► Electrically isolated from the bus	EMF2173IBV003
	► Voltage supply via USB connection on PC ► Electrically isolated from the bus	EMF2177IB

Setpoint potentiometer

The speed can be selected (setpoint selection or selection of field frequency) using an external potentiometer. The setpoint potentiometer is connected to the analogue input terminals to this end. A scale and rotary knob are also available.

Setpoint potentiometer with scale and rotary knob

Design	Product key
10 kOhm / 1 Watt potentiometer	ERPD0010K0001W
Rotary knob, 36 mm diameter	ERZ0001
Scale 0 ... 100 %, 62 mm diameter	ERZ0002

Plug connector for function modules

The plug connector ensures that the function module makes contact with the inverter. The scope of supply for the inverter includes one plug connector. These plug connectors can be ordered separately later on by way of spares.

Plug connector for function modules

Design	Product key
8 plug connectors for function module	E82ZJ011

DIN rail mounting

Up to 2.2 kW the 8200 vector frequency inverters can be secured on DIN rails (35 x 7.5 or 35 x 15) with a special support. At 1.5 and 2.2 kW, mounting on 2 DIN rails with 2 fastenings is also possible.

Design	Product key
DIN rail mounting 0.25 ... 2.2 kW	E82ZJ002

Brake switch

The brake switch comprises a rectifier and an electronic circuit breaker for switching an electromechanical brake. The brake switch is fitted in the control cabinet using two screws. It is controlled using one of the inverter's digital outputs.

Design	Features	Product key
	Brake switch	
Half-wave rectification	▶ Input voltage: AC 320 ... 550 V ▶ Output voltage: DC 180 V (at AC 400 V), DC 225 V (at AC 500 V) ▶ Max. brake current: DC 0.61 A ▶ Degree of protection: IP00	E82ZWBRE
Bridge rectification	▶ Input voltage: AC 180 ... 317 V ▶ Output voltage: DC 205 V (at AC 230 V) ▶ Max. brake current: DC 0.54 A ▶ Degree of protection: IP00	E82ZWBRB

→ Data sheet on E82ZWBRE brake resistor
DS_Brake_8400_0001
Available for download at www.lenze.de/dsc

→ Data sheet on E82ZWBRB brake switch
DS_Brake_8400_0002
Available for download at www.lenze.de/dsc

Shield connection

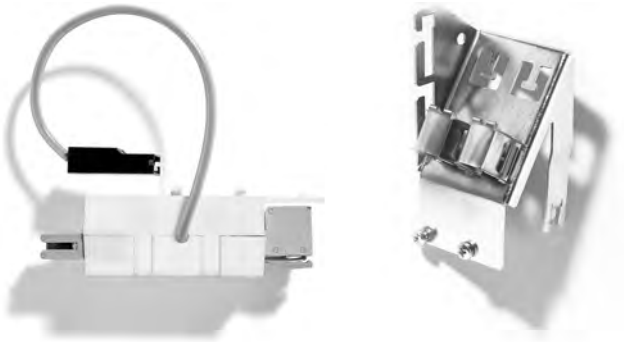
Shield connections are available for quick and easy mounting of shielded cables according to EMC. The scope of supply includes a shield sheet and clips. The shield sheets are angled such that the cables can be guided into the cable duct without too great a bend.

Shield connection

Design	Product key
0.25 ... 0.37 kW control cable shield connection	E82ZWEM1
0.55 ... 2.2 kW control cable shield connection	E82ZWEM2
3.0 ... 11 kW control cable shield connection	E82ZWEM3
15 ... 30 kW power connection shield connection; cable diameter 15 ... 28 mm	EZZ0017

PTC kit

When using unshielded PTC cables in the motor cable, the PTC kit must be used. The scope of supply includes a PTC module alongside the shield connection. The PTC module takes the place of a ferrite core installed in the PTC cable. Prepared terminal connections allow the PTC module to be installed quickly and easily.



PTC kit

Design	Product key
PTC kit for 0.25 ... 0.37 kW	E82ZPE1
PTC kit for 0.55 ... 2.2 kW	E82ZPE2
PTC kit for 3.0 ... 11 kW	E82ZPE3

Overview of modules

Design		Features	Slot	Product key
Function module				
Standard I/O PT		▶ 5 digital inputs ▶ 1 digital output ▶ 1 analog input ▶ 1 analog output ▶ Pluggable terminal strips	FIF	E82ZAFSC010
Application I/O PT		▶ 7 digital inputs ▶ 2 digital outputs ▶ 2 analog inputs ▶ 2 analog outputs ▶ 1 frequency output ▶ Pluggable terminal strips		E82ZAFAC010
AS-i PT		▶ 2 LED for communication status display ▶ 2 freely configurable digital inputs ▶ Pluggable terminal strips		E82ZAFFC010
CAN PT		▶ Lenze system bus ▶ Pluggable terminal strips		E82ZAFCC010
CAN I/O PT		▶ Lenze system bus ▶ 2 freely configurable digital inputs ▶ DIP switch for selecting baud rate and address ▶ Pluggable terminal strips		E82ZAFCC210
CAN I/O RS PT		▶ Lenze system bus ▶ 2 freely configurable digital inputs ▶ DIP switch for selecting baud rate and address ▶ External supply for module and control electronics of inverter (backup operation in event of mains failure) ▶ Pluggable terminal strips		E82ZAFCC100

Note:
- ▶ the pluggable terminal strips of the function module ("PT" design) protrude approx. 15mm out of the front of the inverter.
- ▶ You will find accessories for communication, automation or remote maintenance in the PC-based automation catalogue.

Overview of modules

Design		Features	Slot	Product key
Function module				
CANopen PT		▶ Communication profile: CANopen DS301, V4.02 ▶ Lenze system bus ▶ 2 LED for communication status display ▶ DIP switch for selecting baud rate and address ▶ Pluggable terminal strips	FIF	E82ZAFUC010
DeviceNet PT		▶ 2 LED for communication status display ▶ DIP switch for selecting baud rate and address ▶ Pluggable terminal strips		E82ZAFVC010
INTERBUS PT		▶ 2 LED for communication status display ▶ DIP switch for selecting the number of process and parameter data words ▶ Pluggable terminal strips		E82ZAFIC010
LECOM-B PT		▶ RS 485 ▶ 2 LED for communication status display ▶ Pluggable terminal strips		E82ZAFLC010
PROFIBUS PT		▶ Communication profile: PROFIBUS-DP-V0 ▶ 2 LED for communication status display ▶ Bus terminating resistor can be activated using DIP switch ▶ Pluggable terminal strips		E82ZAFPC010
PROFIBUS I/O		▶ Communication profile: PROFIBUS-DP-V0 and -V1 ▶ 2 LED for communication status display ▶ 2 freely configurable digital inputs ▶ Bus terminating resistor can be activated using DIP switch ▶ DIP switch for address selection ▶ Coated design for operation in industrial environments		E82ZAFPC201

Overview of modules

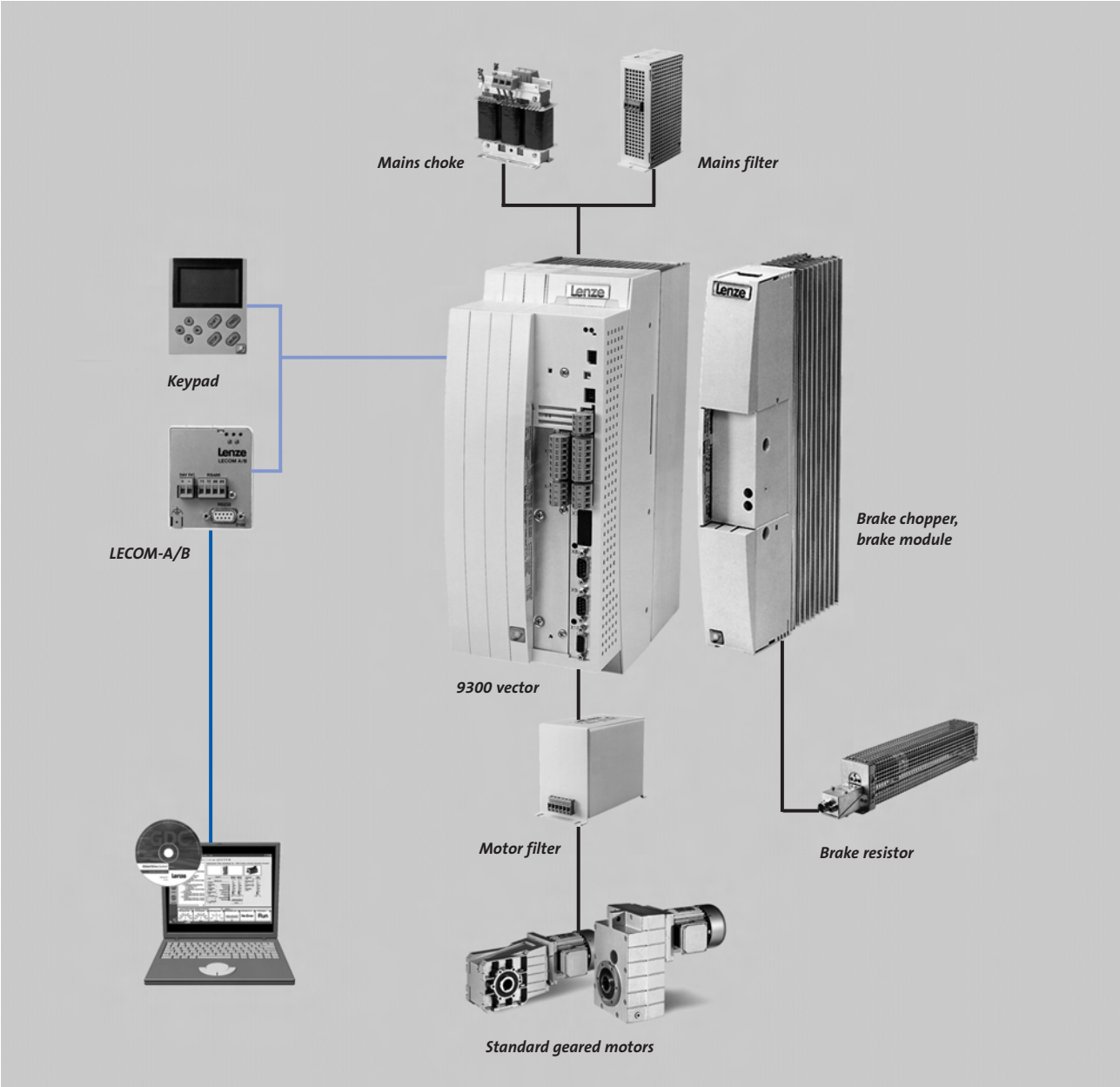
Design		Features	Slot	Product key
Communication module				
CANopen		▶ 2 LED for communication status display ▶ DIP switch for selecting baud rate and address ▶ Pluggable terminal strips	AIF	EMF2178IB
DeviceNet				EMF2179IB
ETHERNET Powerlink		▶ 2 RJ45 connections with LED for link/activity ▶ 2 LED for communication status display ▶ Integrated hub ▶ Controlled node (CN) ▶ External voltage supply possible		EMF2191IB
INTERBUS		▶ 2 LED for communication status display ▶ DIP switch for selecting the number of process and parameter data words		EMF2113IB
LECOM-A		▶ 3 LED for communication status display ▶ RS 232 ▶ Electrically isolated from the bus ▶ No external voltage supply required		EMF2102IBCV004
LECOM-A/B		▶ 3 LED for communication status display ▶ RS 232 or RS 485 ▶ Electrically isolated from the bus ▶ Electrically isolated from external voltage supply		EMF2102IBCV001
LECOM-B		▶ 3 LED for communication status display ▶ RS 485 ▶ Electrically isolated from the bus ▶ Electrically isolated from external voltage supply		EMF2102IBCV002
LECOM-LI		▶ 3 LED for communication status display ▶ Optical fibre ▶ Electrically isolated from external voltage supply		EMF2102IBCV003
PROFIBUS		▶ 2 LED for communication status display ▶ Address can be set by means of a DIP switch ▶ Electrically isolated from the bus ▶ Compatibility switch for predecessor module EMF2131 IB		EMF2133IB

About this catalogue

This catalogue contains all frequency inverter components. The corresponding automation components can be found in the PC-based Automation catalogue.

For some components the "arrow" symbol appears together with an identifier printed in bold. This identifier can be retrieved directly in the electronic catalogue. The catalogue can be found online at:
www.lenze.de/dsc

Inverters and accessories



9300 vector – for challenging applications

Lenze frequency inverters are used in a large number of sectors and applications for electronically adjusting the speed of three-phase asynchronous motors. We offer uniform standard products with flexible scope for use, quick and easy commissioning, reliability and of course high quality. The 9300 vector is a vector-controlled frequency inverter, perfectly equipped for even challenging applications. Excellent drive behaviour, even if not using speed feedback, and undreamed-of scope for solving closed loop and feedback control tasks are just some of the features offered by these frequency inverters. The 9300 vector is typically used in for example extruders, winders, pumps, compressors, fans, blowers, sawing/cutting drives, textile machines and conveyors.

Simple connection
Pluggable screw terminals for digital/analogue inputs and outputs (removable terminal blocks) and Sub-D sockets for feedback and digital frequency signals make possible quick and easy connection of control signals with protection against polarity reversal. All connections can be easily accessed.

Adaptable
The selectable form of the V/f characteristic allows the frequency inverters to be adapted to loads with torque requirements rising in a constant or quadratic manner. The integrated flying restart circuit means that a drive can be easily restarted when the shaft is still turning.

CE conformity
It goes without saying that frequency inverters of the 9300 vector control range satisfy EC directives:
- CE conformity according to the Low-Voltage Directive
- CE conformity according to the electromagnetic compatibility directive for a typical drive configuration with frequency inverter

Energy-saving
The power level is adapted such that the inverter is only driven to suit the current demand for torque/power .

Immediately ready for operation
The frequency inverters are preset for standard use. Amongst other things, parameters are set for:
- controlled acceleration and deceleration using set acceleration and deceleration times
- assignment of inputs and outputs with standard functions

Predefined basic configurations are available for challenging applications (e.g. dancer position control, torque control, traversing control, digital frequency coupling).

User-friendly
A large number of subject- and application-oriented menus simplify the process of solving drive tasks and finding the parameters required for this. Example: the key settings for standard applications can be undertaken using the 32 parameters available under the "user menu". The "user menu" can however also be individually modified and set up with frequently used parameters.

9300 vector – for challenging applications

Effortless operations
The 9300 vector frequency inverter can be quickly and easily adapted to individual requirements using the PC and "Global Drive Control" parameter setting/operating software. Simple dialogues (e.g. short setup) ensure a good overview. Alternatively, a plug-on operating keypad is also available.

The right setpoint source for every requirement
- via a setpoint potentiometer to the control terminals
- via master voltage or master current to the control terminals
- via digital frequency input
- via an operating module
- via a communication module from a host system

Communication-capable
In communication with a host system, inverters can be incorporated using plug-on communication modules:
- LECOM-A/B (RS232/485)
- LECOM-LI (optical fibre)
- INTERBUS
- PROFIBUS-DP
- DeviceNet
- CANopen
- ETHERNET Powerlink

Reliable
An adjustable slip compensation balances load-related speed variations without costly speed feedback. The maximum current limiting function ensures stable operation in all operating points under static and dynamic loads. A PTC thermistor can be connected to protect the motor.

System bus interface (CAN) by default
A bus connection between several Lenze inverters and automation components, for example, can therefore be established at a low wiring cost.

Single-loop and feedback control for free
More than 100 function blocks e.g. PID controllers, flip flops, counters, comparators, delay elements, logic and mathematical functions can be freely interconnected and made available to the user. In a similar way to a PLC, the 9300 vector can then handle other closed loop and feedback control functions in addition to the actual drive task. Master controls can be relieved or even removed altogether – and all for free. The fact that the function block structure can be freely interconnected also means that the 9300 vector can be easily integrated in machine, system and control concepts without any compromises having to be made.

The Lenze geared motor – an ideal partner
The technology behind Lenze geared motors is coordinated to the 9300 frequency inverters. Commissioning is incredibly simple because the frequency inverter is coordinated to the motor data – there is no need to set parameters for the motor data.

Functions and features

Control modes/motor control	V/f control (linear or quadratic) Vector control (torque / speed)
Basic functions	Freely assignable user menu 4 freely programmable parameter sets (can be swapped over online) Fault history buffer DC brake function Flying restart with coasting motor S-ramps for smooth acceleration Max. output frequency 600 Hz Fixed frequencies Masking frequencies 2 PID controllers Freely configurable inputs and outputs Level inversion Logic functions (timer, AND, OR, comparator, arithmetic function) Freely interconnectable function blocks
Predefined applications	Speed control Torque control Digital frequency coupling Dancer position control Step control Traversing control
Monitoring and protective measures	Short circuit Earth fault Overvoltage Motor stalling Motor phase failure detection Load rejection/V-belt monitoring $I^2 \times t$-Motor monitoring Motor overtemperature (input for PTC or thermal contact)
Diagnostics Status displays	2 LEDs
Braking operation Brake chopper Brake resistance	External External

Control connections

Design	9300 vector
Inputs/outputs	
Analog inputs	▶ Quantity: 1, can be swapped over: voltage/current input Voltage: ▶ Resolution: 11 bits + sign ▶ Value range: 0 ... +/-10 V Current: ▶ Quantity: 1 ▶ Resolution 10 bits + sign ▶ Value range: 0 ... +/- 20 mA ▶ Resolution: 11 bits + sign ▶ Value range: 0 ... +/-10 V
Analog outputs	▶ Quantity: 2 ▶ Resolution 9 bits + sign ▶ Value range: 0 ... +/-10 V, max. 2 mA
Digital inputs	▶ Quantity: 7 ▶ Switching level: PLC (IEC 61131-2)
Digital outputs	▶ Quantity: 4 ▶ Switching level: PLC (IEC 61131-2) ▶ Max. output current: 50 mA
External control electronics supply	▶ DC 24 V
Interfaces	
CANopen	▶ Integrated
Extension modules	▶ Optional communication module
Digital frequency [1)]	▶ Output, two-track ▶ Input, two-track
Drive interface	
Resolver input [1)]	▶ Integrated ▶ Sub-D, 9-pin ▶ TTL, two-track ▶ Limit frequency: 500 kHz ▶ KTY evaluation
Encoder input [1)]	▶ Multi-encoder input for: SinCos/TTL incremental encoder, SinCos absolute value encoder single-turn / multi-turn (Hiperface®)

[1)] Tip: prefabricated encoder cables, prefabricated connection cables for the digital frequency interconnection and cables suitable for trailings are described in the catalogue "Servo motors"

→ Circuit diagrams
DS_SP_9300v_0001
Available for download at www.lenze.de/dsc

Standards and operating conditions

Conformity	CE: Low-Voltage Directive (2006/95/EC)
Approvals UL 508C	Power Conversion Equipment (file no. 132659)
Enclosure EN 60529 NEMA	IP20 Protection against contact according to NEMA 250 type 1
Climatic conditions Storage (EN 60721-3-1) Transport (EN 60721-3-2) Operation (EN 60721-3-3) Rated output current derating	1K3 (temperature: -25 °C ... + 55 °C) 2K3 (temperature: -25 °C ... + 70 °C) 0.37 ... 11 kW: 3K3 (temperature: 0 ...+ 55 °C) 15 ... 90 kW: 3K3 (temperature: 0 ...+ 50 °C) above + 45 °C by 2.5 %/°C
Permissible installation height Rated output current derating	0 ... 4000 m amsl Above 1000 m amsl by 5 %/1000 m
Vibration resistance	Acceleration resistant up to 0.7 g according to Germanischer Lloyd, general conditions
Permissible supply forms	Systems with earthed star point (TN and TT systems) Networks with high-impedance or insulated star point (IT networks) with one variant
Leakage current to PE EN 61800-5-1	> 3.5 mA
Noise emission EN 61800-3	Conducted emissions, category C1 or C2 with shielded motor cable: with additional mains filter
Noise immunity EN 61800-3	Category C3
Insulation resistance EN 61800-5-1	Overvoltage category III, more than 2000 m above sea level overvoltage category II
Pollution degree EN 61800-5-1	2
Protective insulation of control circuits EN 61800-5-1	Safe isolation of mains: double/reinforced insulation for digital inputs and outputs

Rated data

- The data is valid for operation at 3/PE AC 400 V.
- Unless otherwise specified, the data refers to the default setting.

→ Other rated data, e.g. for operating with increased rated power
DS_GD_9300v_0001
Available for download at www.lenze.de/dsc

Motor power (asynchronous motor, 4-pole)	**P_N** [kW]	**0.37**	**0.75**	**1.5**	**3**
Product key		**EVF9321-EV**	**EVF9322-EV**	**EVF9323-EV**	**EVF9324-EV**
Mains voltage range	**U_{Netz}** [V]	3/PE AC 320 V -0% ... 528 V +0 %; 45 Hz -0% ... 65 Hz +0%			
Alternative DC supply	**U_{DC}** [V]	DC 460-0 % ... 740 V+0 %			
Rated mains current					
Without mains choke	**I_{Netz}** [A]	2.1	3.5	5.5	[1]
With mains choke	**I_{Netz}** [A]	1.5	2.5	3.9	7
Rated output current	**I_N** [A]	1.5	2.5	3.9	7
Max. output current		2.2	3.7	5.8	10.5
Power loss	**P_V** [W]	50	65	100	150
Dimensions					
Height	**H** [mm]	350			
Width	**B** [mm]	78		97	
Depth	**T** [mm]	250			
Mass	**m** [kg]	5.5		6.9	
Permissible motor cable length					
Shielded [2]	**l** [m]	50			
Unshielded [2]	**l** [m]	100			

[1] Operation only permitted with mains choke or mains filter
[2] Permissible cable length may be affected if EMC conditions have to be met.

→ Dimensioned drawings
DS_MB_9300v_0001
Available for download at www.lenze.de/dsc

Rated data

- The data is valid for operation at 3/PE AC 400 V.
- Unless otherwise specified, the data refers to the default setting.

→ Other rated data, e.g. for operating with increased rated power
DS_GD_9300v_0001
Available for download at www.lenze.de/dsc

Motor power (asynchronous motor, 4-pole)	P_N [kW]	**5.5**	**11**
Product key		**EVF9325-EV**	**EVF9326-EV**
Mains voltage range	U_{Netz} [V]	3/PE AC 320 V -0% ... 528 V +0 %; 45 Hz -0% ... 65 Hz +0%	
Alternative DC supply	U_{DC} [V]	DC 460-0 % ... 740 V+0 %	
Rated mains current			
Without mains choke	I_{Netz} [A]	16.8	[1]
With mains choke	I_{Netz} [A]	12	20.5
Rated output current	I_N [A]	13	23.5
Max. output current		19.5	35
Power loss	P_V [W]	210	360
Dimensions			
Height	**H** [mm]	350	
Width	**B** [mm]	135	
Depth	**T** [mm]	250	
Mass	**m** [kg]	8.9	
Permissible motor cable length			
Shielded [2]	**l** [m]	50	
Unshielded [2]	**l** [m]	100	

[1] Operation only permitted with mains choke or mains filter
[2] Permissible cable length may be affected if EMC conditions have to be met.

→ Dimensioned drawings
DS_MB_9300v_0001
Available for download at www.lenze.de/dsc

Rated data

- The data is valid for operation at 3/PE AC 400 V.
- Unless otherwise specified, the data refers to the default setting.

→ Other rated data, e.g. for operating with increased rated power
DS_GD_9300v_0001
Available for download at www.lenze.de/dsc

Motor power (asynchronous motor, 4-pole)	P_N [kW]	**15**	**22**	**30**	**45**
Product key		**EVF9327-EV**	**EVF9328-EV**	**EVF9329-EV**	**EVF9330-EV**
Mains voltage range	U_{Netz} [V]	3/PE AC 320 V -0% ... 528 V +0 %; 45 Hz -0% ... 65 Hz +0%			
Alternative DC supply	U_{DC} [V]	DC 460-0 % ... 740 V+0 %			
Rated mains current					
Without mains choke	I_{Netz} [A]	43.5		[1]	
With mains choke	I_{Netz} [A]	29	42	55	80
Rated output current	I_N [A]	32	47	59	89
Max. output current		48	70.5	89	134
Power loss	P_V [W]	430	640	810	1100
Dimensions					
Height	**H** [mm]		350		510
Width	**B** [mm]		250		340
Depth	**T** [mm]		250		285
Mass	**m** [kg]		17		35
Permissible motor cable length					
Shielded [2]	**l** [m]	50			
Unshielded [2]	**l** [m]	100			

[1] Operation only permitted with mains choke or mains filter
[2] Permissible cable length may be affected if EMC conditions have to be met.

→ Dimensioned drawings
DS_MB_9300v_0001
Available for download at www.lenze.de/dsc

Rated data

- The data is valid for operation at 3/PE AC 400 V.
- Unless otherwise specified, the data refers to the default setting.

→ Other rated data, e.g. for operating with increased rated power
DS_GD_9300v_0001
Available for download at www.lenze.de/dsc

Motor power (asynchronous motor, 4-pole)	P_N [kW]	**55**	**75**	**90**
Product key		**EVF9331-EV**	**EVF9332-EV**	**EVF9333-EV**
Mains voltage range	U_{Netz} [V]	3/PE AC 320 V -0% ... 528 V +0 %; 45 Hz -0% ... 65 Hz +0%		
Alternative DC supply	U_{DC} [V]	DC 460-0 % ... 740 V+0 %		
Rated mains current				
Without mains choke	I_{Netz} [A]	[1]		[1]
With mains choke	I_{Netz} [A]	100	135	165
Rated output current	I_N [A]	110	145	180
Max. output current		165	217	270
Power loss	P_V [W]	1470	1960	2400
Dimensions				
Height	**H** [mm]	591	680	
Width	**B** [mm]	340	450	
Depth	**T** [mm]	285		
Mass	**m** [kg]	38	70	
Permissible motor cable length				
Shielded [2]	**l** [m]	50		
Unshielded [2]	**l** [m]	100		

[1] Operation only permitted with mains choke or mains filter
[2] Permissible cable length may be affected if EMC conditions have to be met.

→ Dimensioned drawings
DS_MB_9300v_0001
Available for download at www.lenze.de/dsc

Brake choppers and brake resistors

An external brake resistor is needed to decelerate larger moments of inertia or in the event of longer operations in generator mode. It converts braking energy into heat.

Brake resistance ERBM...(IP20)

► The ERBD... brake resistors are tested according to UR

Motor power	Mains voltage	Product key				Brake resistor data			
(asynchronous motor, 4-pole)		Inverter	Brake chopper	Quantity	Brake resistance	Quantity	Resistance	Continuous power	Thermal capacity
P_N [kW]	U_{Netz} [V]						R [Ohm]	P [W]	WK [kWs]
0.37	3 AC 400/480	EVF9321-EV	EMB9352-E	1	ERBM470R050W	1	470	50	7.5
0.75		EVF9322-EV			ERBM470R100W			100	15
1.5		EVF9323-EV			ERBM370R150W		370	150	22.5
3		EVF9324-EV			ERBD180R300W		180	300	45
5.5		EVF9325-EV			ERBD100R600W		100	600	83
11		EVF9326-EV			ERBD047R01K2		47	1200	174
15		EVF9327-EV			ERBD033R02K0		33	2000	240
22		EVF9328-EV							
30		EVF9329-EV							
45		EVF9330-EV		2		2			
55		EVF9331-EV							
75		EVF9332-EV		3		3			
90		EVF9333-EV							

→ Data sheet on ERBM brake resistors
DS_ZB_ERBM_0001
Available for download at www.lenze.de/dsc

→ Data sheet on ERBD brake resistors
DS_ZB_ERBP_0001
Available for download at www.lenze.de/dsc

→ Data sheet on brake choppers
DS_ZB_EMB_0001
Available for download at www.lenze.de/dsc

Brake choppers and brake resistors

Motor power	Mains voltage	Product key			Brake resistor data	
(asynchronous motor, 4-pole)		Inverter	Brake chopper	Brake resistance	Dimensions	Mass
P_N [kW]	U_{Netz} [V]				**H x B x T** [mm]	**m** [kg]
0.37	3 AC 400/480	EVF9321-EV	EMB9352-E	ERBM470R050W	240 x 60 x 59	0.6
0.75		EVF9322-EV		ERBM470R100W	240 x 70 x 59	0.8
1.5		EVF9323-EV		ERBM370R150W	240 x 80 x 95	1
3		EVF9324-EV		ERBD180R300W	439 x 64 x 142	2
5.5		EVF9325-EV		ERBD100R600W	639 x 64 x 142	3.1
11		EVF9326-EV		ERBD047R01K2	639 x 172 x 142	4.9
15		EVF9327-EV		ERBD033R02K0	639 x 262 x 142	7.1
22		EVF9328-EV		ERBD022R03K0	739 x 172 x 247	10.6
30		EVF9329-EV		ERBD018R03K0		
45		EVF9330-EV		ERBD022R03K0		
55		EVF9331-EV		ERBD018R03K0		
75		EVF9332-EV		ERBD022R03K0		
90		EVF9333-EV		ERBD018R03K0		

→ Data sheet on ERBM brake resistors
DS_ZB_ERBM_0001
Available for download at www.lenze.de/dsc

→ Data sheet on brake choppers
DS_ZB_EMB_0001
Available for download at www.lenze.de/dsc

→ Data sheet on ERBD brake resistors
DS_ZB_ERBP_0001
Available for download at www.lenze.de/dsc

Mains chokes

A mains choke is an inductance which is switched in the inverter's mains cable. Using a mains choke delivers the following benefits:

- **less system perturbation:**
  the curved shape of the mains current approaches a sine shape.
- **reduction in effective mains current:**
  reduction in mains, cable and fuse load.

There are no limitations on using a mains choke together with a motor filter.

Mains choke

Please note:

- when using a mains choke, the mains voltage on the inverter input is reduced slightly – typical voltage drop on the mains choke at the rated point approx. 5 %.
- A mains choke or mains filter always has to be used for some inverters because otherwise the permissible rated data for the components used may be exceeded as a result of excess mains currents.
- The following assignment applies to operation with rated power.

Motor power	Mains voltage	Product key		Mains choke data		
(asynchronous motor, 4-pole)		Inverter	Mains choke	Rated current	Dimensions	Mass
P_N [kW]	U_{Netz} [V]			I_N [A]	H x B x T [mm]	m [kg]
0.37	3 AC 400/480	EVF9321-EV	EZN3A2400H002	2	80 x 60 x 94	1
0.75		EVF9322-EV	EZN3A1500H003	3	155 x 95 x 82	1.1
1.5		EVF9323-EV	EZN3A0900H004	4	98 x 70 x 105	1
3		EVF9324-EV [1]	EZN3A0500H007	7	138 x 119 x 95	2.5
5.5		EVF9325-EV	EZN3A0300H013	13	162 x 150 x 106	5.2
11		EVF9326-EV [1]	ELN3-0150H024	24	180 x 86 x 192	8
15		EVF9327-EV	ELN3-0088H035	35	180 x 125 x 225	9.8
22		EVF9328-EV [1]	ELN3-0075H045	45		10.1
30		EVF9329-EV [1]	ELN3-0055H055	55	228 x 120 x 265	13
45		EVF9330-EV [1]	ELN3-0038H085	85	228 x 111 x 263	19.5
55		EVF9331-EV [1]	ELN3-0027H105	105	228 x 155 x 265	20.2
75		EVF9332-EV [1]	ELN3-0022H130	130	264 x 135 x 265	21.4
90		EVF9333-EV [1]	ELN3-0017H170	170	265 x 170 x 268	30.3

[1] Operation only permitted with mains choke or mains filter

→ Data sheet on mains chokes
DS_ZB_ELN_0001
Available for download at www.lenze.de/dsc

Data sheet for mains chokes for operating with increased rated power
DS_ZB_ELN_0002
Available for download at www.lenze.de/dsc

Mains filter

A mains filter is a mains choke and RFI filter combination in a housing. Mains filters offer the same advantages as a mains choke and are also used to comply with interference voltage categories according to European standard EN 61800-3. A distinction is made in this legislation between category C1 and category C2.

Category C1 is used in public networks (residential areas). In terms of limit values category C1 corresponds to class B as laid down in EN 55011.
Category C2 is used in industrial premises, but also in residential areas if deemed appropriate by the user. In terms of limit values category C2 corresponds to class A as laid down in EN 55011.

Mains filter A, mains filter B and other mains filters are available for 9300vector inverters for compliance with interference voltage categories.

Mains filters A and B

The choice of components depends on the motor cable length and interference voltage category required.
- see tables of data
- Category C2, cable length up to 5 m --> mains filter A
- category C2, cable length up to 50 m --> mains filter
- category C1, cable length up to 10 m --> mains filter
- category C1, cable length up to 50 m --> mains filter B

As well as reducing the cable-linked interference voltage, a mains filter achieves the efficiency of a mains choke which also reduces the r.m.s. value of the mains current.Mains chokes or mains filters always have to be used for some controllers because otherwise the permissible rated data of the components used may be exceeded as a result of mains currents.

- See rated data

Mains filters are available in a power range of 0.37 ... 90 kW.

Mains filter A, C2 up to 5m

Mains filter A is used to operate 9300 inverters in industrial areas, e.g. on industrial networks. With mains filter A, EN 61800-3 category C2 up to 5m motor cable length is complied with.

- The filters are designed as add-on filters.
- The motor cable lengths stated are maximum values and depend on inverter type and switching frequency
- The following assignment applies to operation with rated power.

Motor power	Mains voltage	Product key		Mains filter A data			
(asynchronous motor, 4-pole)		Inverter	Mains filter	Max. cable length C2	Rated current	Dimensions	Mass
P_N [kW]	U_{Netz} [V]			l [m]	I_N [A]	H x B x T [mm]	m [kg]
0.37	3 AC 400/480	EVF9321-EV	EZN3A2400H002	5	1.5	80 x 68 x 92	0.8
0.75		EVF9322-EV	EZN3A1500H003		2.5	95 x 82 x 115	1.2
1.5		EVF9323-EV	EZN3A0900H004		4	98 x 70 x 105	1.4
3		EVF9324-EV	EZN3A0500H007		7	120 x 75 x 122	2.4
5.5		EVF9325-EV	EZN3A0300H013		13	152 x 100 x 142	5.2
11		EVF9326-EV	EZN3A0150H024		24	260 x 135 x 230	8.9

→ Data sheet on mains filters
DS_ZB_EZN_0001
Available for download at www.lenze.de/dsc

→ Data sheet for mains filter for operating with increased rated power
DS_ZB_EZN_0003
Available for download at www.lenze.de/dsc

Mains filter B, C1 up to 50 m

Mains filter B is used to operate 9300 controllers on public supply networks or in industrial areas. With mains filter B, EN 61800-3 category C1 up to 50m motor cable length is complied with .

- The filters are designed as add-on filters.
- The motor cable lengths stated are maximum values and depend on inverter type and switching frequency
- The following assignment applies to operation with rated power.

Motor power	Mains voltage	Product key		Mains filter B data			
(asynchronous motor, 4-pole)		Inverter	Mains filter	Rated current	Max. cable length C1	Dimensions	Mass
P_N [kW]	U_{Netz} [V]			I [A]	l [m]	H x B x T [mm]	m [kg]
0.37	3 AC 400/480	EVF9321-EV	EZN3B2400H002	1.5	50	150 x 78 x 230	2.5
0.75		EVF9322-EV	EZN3B1500H003	2.5			3
1.5		EVF9323-EV	EZN3B0900H004	4			3.1
3		EVF9324-EV	EZN3B0500H007	7		180 x 97 x 230	4.6
5.5		EVF9325-EV	EZN3B0300H013	13		260 x 135 x 230	11.8
11		EVF9326-EV	EZN3B0150H024	24			12.1

→ Data sheet on mains filters
DS_ZB_EZN_0001
Available for download at www.lenze.de/dsc

→ Data sheet for mains filter for operating with increased rated power
DS_ZB_EZN_0002
Available for download at www.lenze.de/dsc

Mains filter, C1 up to 10 m and C2 up to 50 m

The mains filter is used for inverters with a 15 ... 90kW power in order to operate with up to a 50m motor cable length in industrial areas or with up to a 10m motor cable length on public networks. Mains filters correspond to category C1 EN 61800-3 up to 10m motor cable length and category C2 EN 61800-3 up to 50m motor cable length.

- The filters are designed as footprint filters.
- Built-on mains filters are also available (category C1 with 50m of shielded motor cable)
- When mounting the inverter in cold plate technology, only built-on mains filters can be used for interference suppression.
- The motor cable lengths stated are maximum values and depend on the inverter type and switching frequency.
- The following assignment applies to operation with rated power.

Motor power	Mains voltage	Product key		Mains filter data		
(asynchronous motor, 4-pole)		Inverter	Mains filter	Rated current	Dimensions	Mass
P_N [kW]	U_{Netz} [V]			I_N [A]	H x B x T [mm]	m [kg]
15	3 AC 400/480	EVF9327-EV	E82ZN22334B230	42	410 x 236 x 110	13
22		EVF9328-EV				
30		EVF9329-EV	E82ZN30334B230	55		19
45		EVF9330-EV	E82ZN45334B230	80	580 x 318 x 114	26
55		EVF9331-EV	E82ZN55334B230	100	685 x 318 x 114	29
75		EVF9332-EV	E82ZN75334B230	135	760 x 428 x 114	53
90		EVF9333-EV	E82ZN90334B230	165	765 x 428 x 114	90

→ Data sheet on mains filters E82ZN
DS_ZB_E82ZN_0001
Available for download at www.lenze.de/dsc

Motor filter

You use motor filters to reduce the load on the motor winding and to reduce discharge current to PE with long motor cables. Motor filters ensure reliable drive operations with up to 100m of shielded or 200m of unshielded motor cable.

- The voltage drop on the motor filter with a filter rated current and a frequency of 50Hz is typically around 3% of the max. output voltage of the inverter. Observe the operating conditions of the motor filter .

Motor filter

A motor filter is needed:

- as of 50m of shielded or 100m of unshielded motor cable (regardless of observance of EMC requirements)
- When using unshielded motor cables, compliance with EMC only applies with regard to cable-linked interference emissions.
- The following assignment applies to operation with rated power.

Motor power	Mains voltage	Product key		Motor filter data			
(asynchronous motor, 4-pole)		Inverter	Motor filter	Rated current	Voltage drop	Required for motor cable lengths equal to and greater than	Max. motor cable length
P_N [kW]	U_{Netz} [V]			I_N [A]	[%]	l [m]	l [m]
0.37	3 AC 400/480	EVF9321-EV	ELM3-030H004	4	2 - 3	Shielded 50 Unshielded 100	Shielded 100 Unshielded 200
0.75		EVF9322-EV					
1.5		EVF9323-EV					
3		EVF9324-EV	ELM3-014H010	10			
5.5		EVF9325-EV	ELM3-007H025	25			
11		EVF9326-EV					
15		EVF9327-EV	ELM3-004H055[1)]	55			
22		EVF9328-EV					

[1)] Mains voltage: AC 400/460

→ Data sheet on motor filters
DS_ ZB_ELM_0001
Available for download at www.lenze.de/dsc

→ Data sheet for motor filters for operating with increased rated power
DS_ZB_ELM_0002
Available for download at www.lenze.de/dsc

Keypad XT

The keypad is provided to visualise the operating parameters and set parameters for the inverter. The keypad is plugged onto the front of the inverter and is also used for the status display, error diagnosis and, with integrated memory, to transfer parameters to other inverters.

Keypad XT

As an alternative, the diagnosis terminal with integrated XT keypad is available for visualising the operating parameters and inverter parameter setting

Design		Features	Slot	Product key
		Keypads and accessories		
Keypad XT		▶ Password protection ▶ Plain text display ▶ Predefined basic configurations ▶ User-specific menus ▶ Suitable for the 8200 vector and 9300 inverters series ▶ IP20 degree of protection	AIF	EMZ9371BC
Diagnosis terminal with XT keypad		▶ Diagnosis terminal complete with XT keypad (EMZ9371BC) ▶ Suitable for the 8200 and 9300 inverters series ▶ IP20 degree of protection		E82ZBBXC
Connection cable [1)]		▶ Connection cable, 2.5 m		E82ZWL025
		▶ Connection cable, 5 m		E82ZWL050
		▶ Connection cable, 10 m		E82ZWL100

[1)] Required for use of diagnosis terminal.

PC interface (RS232)

Using a PC and the LECOM-A (RS232) communication module, the inverter can be operated and diagnosed (as an alternative to using a keypad) via the convenient and free of charge "Global Drive Control easy" parameter setting / operating software. A PC system cable is used to link to the PC.

PC interface (RS232)

Design		Features	Slot	Product key
LECOM-A communication module		▶ 3 LED for communication status display ▶ RS 232 ▶ Electrically isolated from the bus ▶ No external voltage supply required	AIF	EMF2102IBCV004
PC system cable		▶ PC system cable 0.5 m		EWL0048
		▶ PC system cable 5 m		EWL0020
		▶ PC system cable 10 m		EWL0021

→ Data sheet on PC interface (RS232)
DS_ZB_EMF_0001
Available for download at www.lenze.de/dsc

PC system bus adapter

Alternatively in a CAN network, operation and diagnostics with the PC can also be undertaken using an inverter CAN interface. The PC system bus adapter is plugged onto the PC's parallel interface or USB connection. The corresponding drivers are installed automatically. Depending on version, the adapter's voltage supply comes via the PC's DIN connection, PS2 connection or USB connection.

EMF2173IBV003 adapter

Design	Features	Product key
PC system bus adapter	▶ Voltage supply via DIN connection on PC	EMF2173IB
	▶ Voltage supply via PS2 connection on PC	EMF2173IBV002
	▶ Voltage supply via PS2 connection on PC ▶ Electrically isolated from the bus	EMF2173IBV003
	▶ Voltage supply via USB connection on PC ▶ Electrically isolated from the bus	EMF2177IB

→ Data sheet on PC system bus adapter
DS_ZB_EMF_0002
Available for download at www.lenze.de/dsc

Brake switch

The brake switch comprises a rectifier and an electronic circuit breaker for switching an electromechanical brake. The brake switch is fitted in the control cabinet using two screws. It is controlled using one of the inverter's digital outputs.

Brake switch

Design	Features	Product key
	Brake switch	
Half-wave rectification	▶ Input voltage: AC 320 ... 550 V ▶ Output voltage: DC 180 V (at AC 400 V), DC 225 V (at AC 500 V) ▶ Max. brake current: DC 0.61 A ▶ Degree of protection: IP00	E82ZWBRE
Bridge rectification	▶ Input voltage: AC 180 ... 317 V ▶ Output voltage: DC 205 V (at AC 230 V) ▶ Max. brake current: DC 0.54 A ▶ Degree of protection: IP00	E82ZWBRB

→ Data sheet on E82ZWBRE brake resistor
DS_Brake_8400_0001
Available for download at www.lenze.de/dsc

→ Data sheet on E82ZWBRB brake switch
DS_Brake_8400_0002
Available for download at www.lenze.de/dsc

Setpoint potentiometer

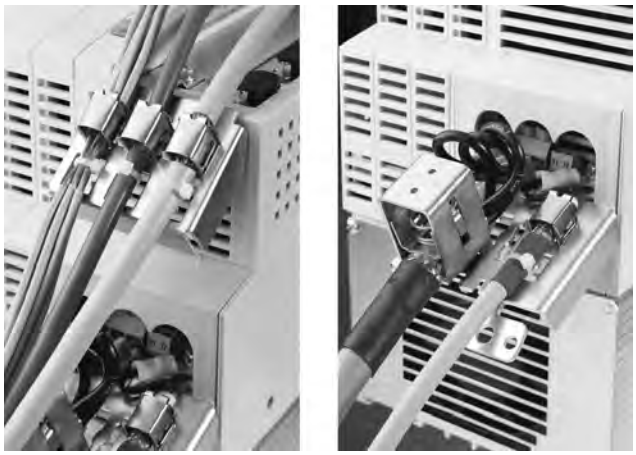
The speed can be selected (setpoint selection or selection of field frequency) using an external potentiometer. The setpoint potentiometer is connected to the analogue input terminals to this end. A scale and rotary knob are also available.

Setpoint potentiometer with scale and rotary knob

Design	Product key
1 kOhm / 1 Watt potentiometer	ERPD0001K0001W
Rotary knob, 36 mm diameter	ERZ0001
Scale 0 ... 100 %, 62 mm diameter	ERZ0002

Shield connection

Shield connections are available for quick and easy mounting of shielded cables according to EMC. The scope of supply includes the corresponding shield sheet, spring-wire clamps and/or snap-in clips for reliable contacting between cable shield and shield sheet. The shield sheets are angled such that the cables can be guided into the cable duct without too great a bend.



Shield connection

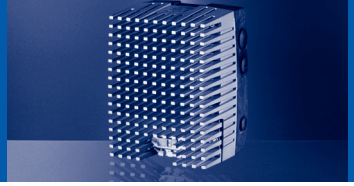
Design	Product key
Control cable shield connection	EZZ0015
0.37 ... 11 kW power connection shield connection; cable diameter 8 ... 20 mm	EZZ0016
15 ... 30 kW power connection shield connection; cable diameter 15 ... 28 mm	EZZ0017

Overview of modules

The inverters have a slot for the operating module or a module.

The slot is located at the front of the drive. The following tables describe the available modules.

Design		Features	Slot	Product key
Communication module				
CANopen		▶ 2 LED for communication status display ▶ DIP switch for selecting baud rate and address ▶ Pluggable terminal strips	AIF	EMF2178IB
DeviceNet				EMF2179IB
ETHERNET Powerlink		▶ 2 RJ45 connections with LED for link/activity ▶ 2 LED for communication status display ▶ Integrated hub ▶ Controlled node (CN) ▶ External voltage supply possible		EMF2191IB
INTERBUS		▶ 2 LED for communication status display ▶ DIP switch for selecting the number of process and parameter data words		EMF2113IB
LECOM-A/B		▶ 3 LED for communication status display ▶ RS 232 or RS 485 ▶ Electrically isolated from the bus ▶ Electrically isolated from external voltage supply		EMF2102IBCV001
LECOM-B		▶ 3 LED for communication status display ▶ RS 485 ▶ Electrically isolated from the bus ▶ Electrically isolated from external voltage supply		EMF2102IBCV002
LECOM-LI		▶ 3 LED for communication status display ▶ Optical fibre ▶ Electrically isolated from external voltage supply		EMF2102IBCV003
PROFIBUS		▶ 2 LED for communication status display ▶ Address can be set by means of a DIP switch ▶ Electrically isolated from the bus ▶ Compatibility switch for predecessor module EMF2131 IB		EMF2133IB

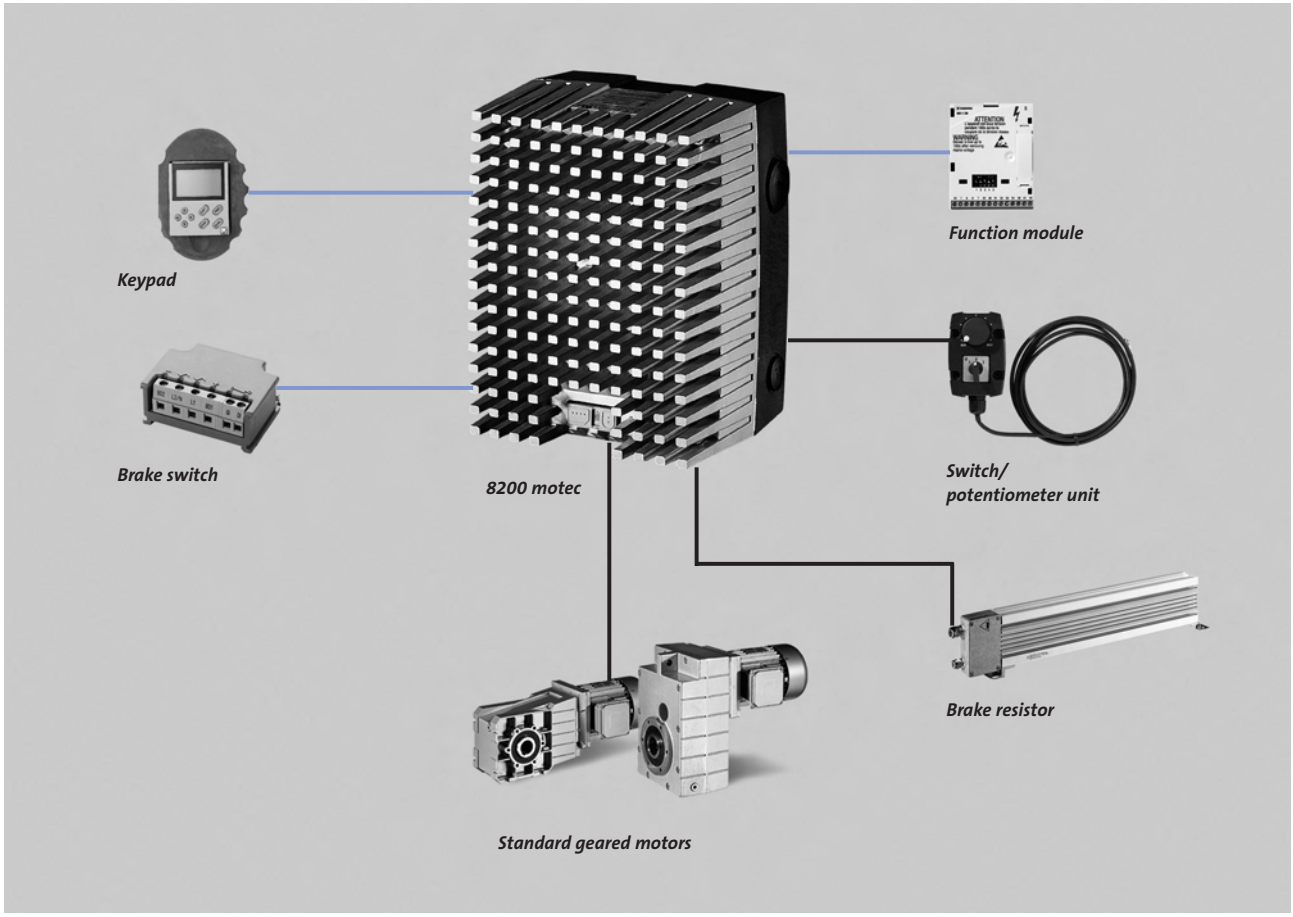


About this catalogue

This catalogue contains all frequency inverter components. The corresponding automation components can be found in the PC-based Automation catalogue.

For some components the "arrow" symbol appears together with an identifier printed in bold. This identifier can be retrieved directly in the electronic catalogue. The catalogue can be found online at:
www.lenze.de/dsc

Inverters and accessories



8200 motec – for distributed drive tasks

Lenze frequency inverters are used in a large number of sectors and applications for electronically adjusting the speed of three-phase asynchronous motors. We offer uniform standard products with flexible scope for use, quick and easy commissioning, reliability and of course high quality.
8200 motec is a robust frequency inverter with a high degree of protection for the 0.25 ... 7.5 kW power range which is ideal for distributed drive tasks.
For example it can be fitted near the motor on the machine frame to offer optimum access in any mounting position. The power supply is disconnected from the drive electronics using plug-in contacts. In the event of service all you need do is loosen four screws to replace the heatsink and all electronics.
Integrable function modules allow the 8200 motec to be incorporated in the control and automation set-up of your machine or plant with a precise fit.
The 8200 motec is related to the "control cabinet frequency inverter“ 8200 vector offering the same function. Operation, diagnostics, functionality and drive behaviour are all the same which offers benefits in combined central/distributed concepts. The device is either operated via the XT keypad operating module or via a PC together with the convenient and free of charge GDCeasy operating software.

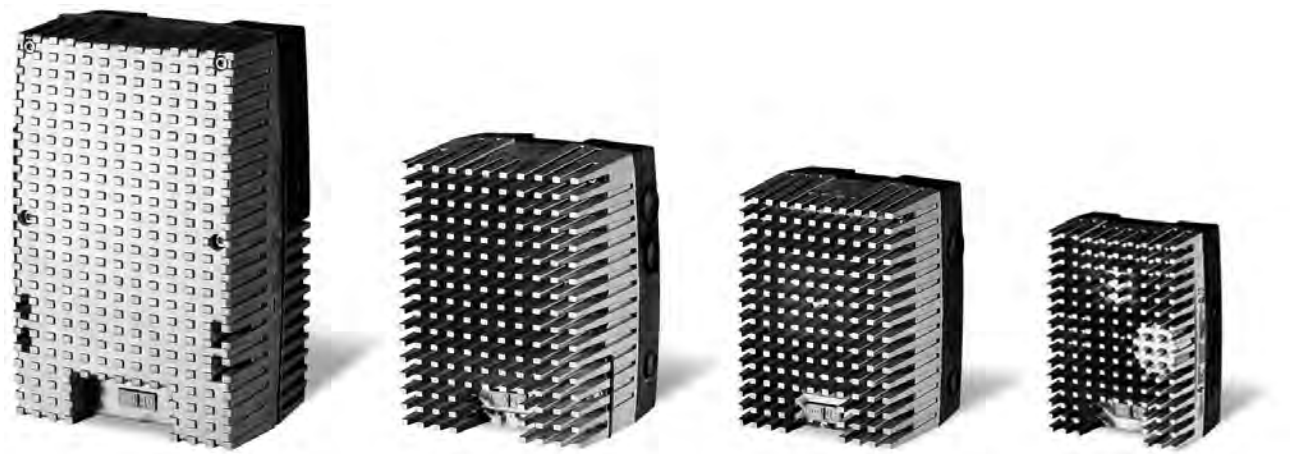
Very simple retrofitting
Other than the mains supply, no extra control voltage is needed to operate the 8200 motec, allowing what have previously been uncontrolled systems to be retrofitted at little cost for the purpose of process optimisation.

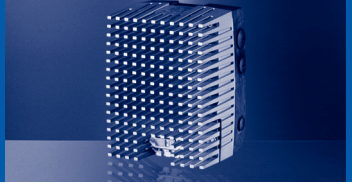
Adaptable
The selectable form of the V/f characteristic allows the frequency inverters to be adapted to loads with torque requirements rising in a constant or quadratic manner. The integrated flying restart circuit means that a drive can be easily restarted when the shaft is still turning.

Energy-saving
The power level is adapted such that the inverter is only driven to suit the current demand for torque/power.

Immediately ready for operation
The frequency inverters are preset for standard use Amongst other things, parameters are set for:
- controlled acceleration and deceleration using set acceleration and deceleration times
- assignment of inputs and outputs with standard functions

Clear
The XT keypad is also available for operation. Users can quickly access all inverter parameters in the clear menu structure using the 8 keys and a text display. The XT keypad is also used for status display, error diagnosis and, thanks to its integrated memory, for transferring settings to other inverters.





8200 motec – for distributed drive tasks

The right setpoint source for every requirement

- via setpoint potentiometer to the control terminals
- via master voltage or master current to the control terminals
- via digital frequency input
- via an operator module
- via a bus module from a host system

Reliable

An adjustable slip compensation balances load-related speed variations without costly speed feedback. The maximum current limiting function ensures stable operation in all operating points under static and dynamic loads. A PTC thermistor can be connected to protect the motor.

Communication-capable

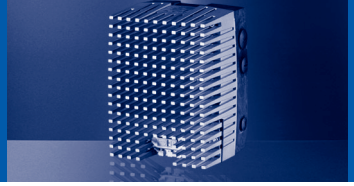
In communication with a host system, inverters can be incorporated using plug-on bus modules. Virtually all common field bus systems are available (CAN, CANopen, PROFIBUS, INTERBUS, DeviceNet, AS interface and ETHERNET Powerlink).

Used around the world

Thanks to the huge mains voltage range of up to 500 V (+10%), you don't need to worry about where in the world your machine is supplied. And the 8200 vector series is of course certified in line with international standards.

Functions and features

Control modes/motor control	V/f control (linear or quadratic) Zero-sensor vector control
Basic functions	Freely assignable user menu 4 freely programmable parameter sets (can be swapped over online) Fault history buffer DC brake function Flying restart with coasting motor S-ramps for smooth acceleration Max. output frequency 650 Hz Fixed frequencies Masking frequencies PID controller Freely configurable inputs and outputs Level inversion
Monitoring and protective measures	Short circuit Earth fault Overvoltage Motor stalling Motor phase failure detection Load rejection/V-belt monitoring I^2 x t-Motor monitoring Motor overtemperature (input for PTC or thermal contact)
Diagnostics Status displays	2 LEDs
Braking operation Brake chopper Brake resistance	Integrated External



Control connections

The 8200 motec receives digital and analogue inputs and outputs through an I/O function module. These are used to control the inverter and/or incorporate it in automation and control concepts.
Communication with a host system can be established and matched to the application using a plug-in communication module as an extra or alternative. This ensures great flexibility for various drive and automation tasks .

You can select from three different I/O modules:
- standard I/O for standard applications
- application I/O for challenging applications
- bus I/O for bus and I/O mixed operation (a bus function module is also needed)

The function modules are integrated in the 8200 motec carrier housing.

Design	**8200 motec with standard I/O**	**8200 motec with application I/O**	**8200 motec with bus I/O**
Product key I/O function module	**E82ZAFSC010**	**E82ZAFAC010**	**E82ZMFBC001 (0.25 ... 0.37 kW)** [1] **E82ZAFBC001 (0.55 ... 2.2 kW)** **E82ZAFBC201 (3.0 ... 7.5 kW)**
Inputs/outputs Analog inputs	▶ Quantity: 1 ▶ Voltage or current input (can be switched over) ▶ Resolution: 10 bits ▶ Value range: 0 ... +/-10 V, 0/4 ... 20 mA	▶ Quantity: 2 ▶ Voltage or current input (can be switched over) ▶ Resolution: 10 bits ▶ Value range: 0 ... +/-10 V, 0/4 ... 20 mA	▶ Quantity: 1 ▶ Voltage or current input (can be switched over) ▶ Resolution: 10 bits ▶ Value range: 0 ... +/-10 V, 0/4 ... 20 mA
Analog outputs	▶ Quantity: 1 ▶ Resolution: 10 bits ▶ Value range: 0 ... 10 V, max. 2 mA	▶ Number: 2, optional: voltage or current input ▶ Resolution: 10 bits Voltage: ▶ Value range: 0 ... 10 V, max. 2 mA Current: ▶ Value range: 0/4 ... 20 mA	▶ Quantity: 1 ▶ Resolution: 10 bits ▶ Value range: 0 ... 10 V, max. 2 mA
Digital inputs	▶ Quantity: 5 ▶ Switching level: PLC (IEC 61131-2) ▶ 2 inputs, can optionally be used as a frequency input (10 kHz, 1-track)	▶ Quantity: 7 ▶ Switching level: PLC (IEC 61131-2) ▶ 2 inputs, can optionally be used as a frequency input (10 kHz, 2-track)	▶ Quantity: 5 ▶ Switching level: PLC (IEC 61131-2) ▶ 2 inputs, can optionally be used as a frequency input (10 kHz, 1-track)
Digital outputs	▶ Quantity: 1 ▶ Switching level: PLC (IEC 61131-2) ▶ Max. output current: 50 mA	▶ Quantity: 2 ▶ Switching level: PLC (IEC 61131-2) ▶ Quantity: 1, frequency output (10 kHz, HTL) ▶ Max. output current: 8 A ▶ Max. output current: 50 A	▶ Quantity: 1 ▶ Switching level: PLC (IEC 61131-2) ▶ Max. output current: 50 mA
Relay	▶ Quantity: 1 (15 ... 90 kW: 2) ▶ Contact: change-over ▶ AC connection: 250 V, 3 A ▶ DC connection: 24 V, 2 A	▶ Quantity: 1 (15 ... 90 kW: 2) ▶ Contact: change-over ▶ AC connection: 250 V, 3 A ▶ DC connection: 24 V, 2 A	▶ Quantity: 1 (15 ... 90 kW: 2) ▶ Contact: change-over ▶ AC connection: 250 V, 3 A ▶ DC connection: 24 V, 2 A
Interfaces Extension modules			▶ Bus function module needed

[1] Bus I/O incl. terminal cradle (observe installation height)

→ Circuit diagrams
DS_SP_8200m_0001
Available for download at www.lenze.de/dsc

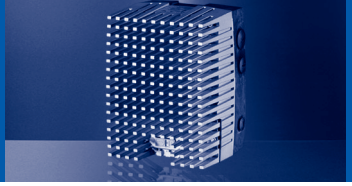
→ Dimension sheet for bus I/O (0.25 ... 0.37 kW)
DS_MB_8200m_0001
Available for download at www.lenze.de/dsc

Standards and operating conditions

Conformity	CE: Low-Voltage Directive (2006/95/EC)
Approvals UL 508C	Power Conversion Equipment (file no. 132659)
Enclosure EN 60529 NEMA	IP65 (IP54 for 3.0 ... 7.5 kW with fan module E82ZMV) Protection against accidental contact according to NEMA 250 type 4 (type 12)
Climatic conditions Storage (EN 60721-3-1) Transport (EN 60721-3-2) Operation (EN 60721-3-3) Rated output current derating	 1K3 (temperature: -25 °C ... + 60 °C) 2K3 (temperature: -25 °C ... + 70 °C) 3K3 (temperature: -20 °C ... + 60 °C) above + 40 °C by 2.5 %/°C
Permissible installation height Rated output current derating	0 ... 4000 m amsl Above 1000 m amsl by 5%/1000 m
Vibration resistance	Acceleration resistant up to 2 g according to Germanischer Lloyd, general conditions

Permissible supply forms	Operation on TT systems, TN systems or systems with earthed neutral without additional measures Operation on IT systems not possible The devices are approved only for operation on symmetrical systems. Operation on systems with earthed phase conductor is not permitted.
Leakage current to PE EN 61800-5-1	> 3.5 mA
Noise emission EN 61800-3	Cable-guided, category C2 up to 1 m shielded motor cable: with integrated RFI measures [1)] Cable-guided, category C2 up to 10 m shielded motor cable: with integrated RFI measures [1)]
Noise immunity EN 61800-3	Category C3
Insulation resistance EN 61800-5-1	Overvoltage category III, more than 2000 m above sea level overvoltage category II
Pollution degree EN 61800-5-1	2
Protective insulation of control circuits EN 61800-5-1	Safe isolation of mains: double/reinforced insulation

[1)] Motor cable lengths depend on inverter type and switching frequency



Rated data

- The data is valid for operation at 1 /N/PE AC 230 V.
- Unless otherwise specified, the data refers to the default setting with a switching frequency of 8 kHz.

→ Other rated data, e.g. for operating with increased rated power
DS_GD_8200m_0001
Available for download at www.lenze.de/dsc

Motor power (asynchronous motor, 4-pole)	P_N [kW]	**0.25**	**0.37**
Product key		**E82MV251_2B001**	**E82MV371_2B001**
Mains voltage range	U_{Netz} [V]	1/N/PE AC 180 V -0% ... 264 V +0%; 45 Hz -0% ... 65 Hz +0%	
Rated mains current	I_{Netz} [A]	3.4	5
Rated output current 8 kHz	I_N [A]	1.7	2.4
Max. output current 8 kHz	I_{max} [A]	2.5	3.6
Power loss	P_V [W]	30	40
Dimensions			
Height	**H** [mm]	190	
Width	**B** [mm]	138	
Depth [1)]	**T** [mm]	100	
Mass	**m** [kg]	1.8	

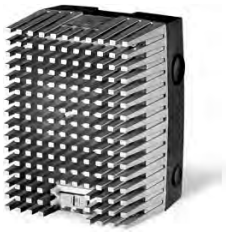
[1)] When using bus I/O or brake switch: 135 mm.

→ Dimensioned drawings
DS_MB_8200m_0001
Available for download at www.lenze.de/dsc

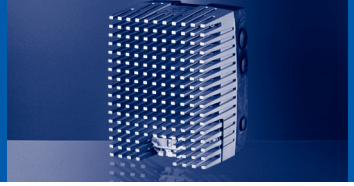
Rated data

- The data is valid for operation at 3/N/PE AC 400 V.
- Unless otherwise specified, the data refers to the default setting with a switching frequency of 8 kHz.

→ Other rated data, e.g. for operating with increased rated power
DS_GD_8200m_0001
Available for download at www.lenze.de/dsc

					
Motor power (asynchronous motor, 4-pole)	**P_N** [kW]	**0.55**	**0.75**	**1.5**	**2.2**
Product key		**E82MV551_4B001**	**E82MV751_4B001**	**E82MV152_4B001**	**E82MV222_4B001**
Mains voltage range	**U_{Netz}** [V]	3/PE AC 320 V-0 % ... 550 V+0 %; 45 Hz-0 % ... 65 Hz+0 %			
Rated mains current	**I_{Netz}** [A]		2.4	3.8	5.5
Rated output current 8 kHz	**I_N** [A]	1.8	2.4	3.9	5.6
Max. output current 8 kHz	**I_{max}** [A]	2.7	3.6	5.8	8.4
Power loss	**P_V** [W]	35	45	70	95
Dimensions					
Height	**H** [mm]	202		230	
Width	**B** [mm]	156		176	
Depth	**T** [mm]	151		167	
Mass	**m** [kg]	2.8		4.1	

→ Dimensioned drawings
DS_MB_8200m_0001
Available for download at www.lenze.de/dsc



Rated data

- The data is valid for operation at 3/N/PE AC 400 V.
- Unless otherwise specified, the data refers to the default setting with a switching frequency of 8 kHz.
- Depending on the application (e.g. with wall mounting), the E82ZMV fan module is needed (see accessories chapter).

→ Other rated data, e.g. for operating with increased rated power
DS_GD_8200m_0001
Available for download at www.lenze.de/dsc

Motor power (asynchronous motor, 4-pole)	P_N [kW]	**3**	**4**	**5.5**	**7.5**
Product key		**E82MV302_4B001**	**E82MV402_4B001**	**E82MV552_4B001**	**E82MV752_4B001**
Mains voltage range	U_{Netz} [V]	3/PE AC 320 V-0 % ... 550 V+0 %; 45 Hz-0 % ... 65 Hz+0 %			
Rated mains current	I_{Netz} [A]	9.5	12.3	16.8	21.5
Rated output current 8 kHz	I_N [A]	7.3	9.5	13	16.5
Max. output current 8 kHz	I_{max} [A]	11	14.2	19.5	24.8
Power loss	P_V [W]	140	180	230	290
Dimensions					
Height	**H** [mm]	325			
Width	**B** [mm]	211			
Depth [1)]	**T** [mm]	163			
Mass	**m** [kg]	9.7			

[1)] When using the E82ZMV fan module: 223 mm

→ Dimensioned drawings
DS_MB_8200m_0001
Available for download at www.lenze.de/dsc

Brake choppers and brake resistors

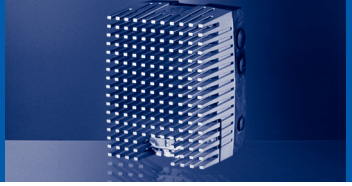
An external brake resistor is needed to decelerate larger moments of inertia or in the event of longer operations in generator mode. It converts braking energy into heat.
The brake resistors recommended in the table are designed for around 1.5 times the regenerative power for a cycle time of 15/135 s (brake/pause). The brake resistors are fitted with a thermostat (potential-free NC contact).

Brake resistance ERBS... (IP65)

Motor power	Mains voltage	Product key			Brake resistor data			
(asynchronous motor, 4-pole)		Inverter	Brake chopper	Brake resistance	Quantity	Resistance	Continuous power	Thermal capacity
P_N [kW]	U_{Netz} [V]					**R** [Ohm]	**P** [W]	**WK** [kWs]
0.25	1 AC 230/240	E82MV251_2B001	Integrated	ERBS470R150W	1	470	150	22.5
0.37		E82MV371_2B001						
0.55	3 AC 400/500	E82MV551_4B001						
0.75		E82MV751_4B001						
1.5		E82MV152_4B001		ERBS240R300W		240	300	45
2.2		E82MV222_4B001						
3		E82MV302_4B001		ERBS180R350W		180	350	53
4		E82MV402_4B001		ERBS100R625W		100	625	94
5.5		E82MV552_4B001						
7.5		E82MV752_4B001		ERBS082R780W		82	780	117

Motor power	Mains voltage	Product key			Brake resistor data	
(asynchronous motor, 4-pole)		Inverter	Brake chopper	Brake resistance	Dimensions	Mass
P_N [kW]	U_{Netz} [V]				**H x B x T** [mm]	**m** [kg]
0.25	1 AC 230/240	E82MV251_2B001	Integrated	ERBS470R150W	222 x 124 x 122	1.3
0.37		E82MV371_2B001				
0.55	3 AC 400/500	E82MV551_4B001				
0.75		E82MV751_4B001				
1.5		E82MV152_4B001		ERBS240R300W	382 x 124 x 122	2.1
2.2		E82MV222_4B001				
3		E82MV302_4B001		ERBS180R350W		
4		E82MV402_4B001		ERBS100R625W	566 x 124 x 122	3.1
5.5		E82MV552_4B001				
7.5		E82MV752_4B001		ERBS082R780W	666 x 124 x 122	3.6

→ Data sheet on brake resistors
DS_ZB_ERBS_0001
Available for download at www.lenze.de/dsc



Keypad

The keypad is provided to visualise the operating parameters and set parameters for the inverter. The keypad is plugged onto the front of the inverter and is also used for the status display, error diagnosis and, with integrated memory, to transfer parameters to other inverters.

Diagnosis terminal with keypad and connection cable

Design		Features	Slot	Product key
		Keypads and accessories		
Diagnosis terminal with XT keypad		▶ Diagnosis terminal complete with XT keypad (EMZ9371BC) ▶ Suitable for the 8200 and 9300 inverters series ▶ IP20 degree of protection	AIF	E82ZBBXC
Diagnosis terminal with keypad		▶ Diagnosis terminal complete with keypad (E82ZBC) ▶ Suitable for 8200 inveter series ▶ IP55 degree of protection		E82ZBB
Connection cable		▶ Connection cable, 2.5 m		E82ZWL025
		▶ Connection cable, 5 m		E82ZWL050
		▶ Connection cable, 10 m		E82ZWL100

PC interface (RS232)

Using a PC and the PC interface (RS232), the inverter can be operated and diagnosed (as an alternative to using a keypad) via the convenient and free of charge "Global Drive Control easy" parameter setting/operating software. A PC system cable is used to link to the PC , a connection cable to link to the inverter.

PC interface (RS232) with connection cable and PC system cable

Design		Features	Slot	Product key
Diagnosis terminal with RS 232 interface		▶ RS 232 ▶ 2 LED for communication status display ▶ No external voltage supply required	FIF	E82ZBL-C
PC system cable		▶ PC system cable 0.5 m		EWL0048
		▶ PC system cable 5 m		EWL0020
		▶ PC system cable 10 m		EWL0021

Wiring terminals

Wiring terminals allow mains or control cables to be looped through and wired in the carrier housing of the 8200 motec. A "power bus" can be set up in conjunction with the mains bus connectors.
System terminals are perfect for connecting and wiring control cables.

- 3 ... 7.5 kW:
  When using standard twin wire end ferrules, mains cables of up to 4 mm² can be rounded in the motec carrier housing.

Wiring terminals E82ZWKN4 and E82ZWKN2

Design	Product key
Mains bus connector 0.25 ... 0.37 kW (max. 16 A)	E82ZWKN2
Mains bus connector 0.55 ... 2.2 kW (max. 24 A)	E82ZWKN4
System terminals (12-pole) 0.55 ... 2.2 kW [1]	E82ZWKS

[1] System terminals cannot be used in combination with bus I/O or brake switch

Current limiting module

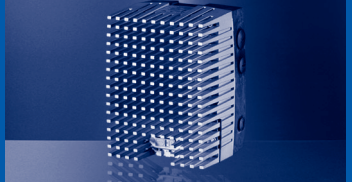
A current limiting module reduces the current peak when the 8200 motec(s) is (are) started up on the mains supply. The module is designed for DIN rail mounting.

Current limiting module

Design	Product key
Current limiting module 0.25 ... 2.2 kW (max. 20 A)	E82ZJ004 [2]

[2] At 0.55 ... 2.2 kW: use 3 items

→ Data sheet on current limiting module
DS_ZB_SBM_0001
Available for download at www.lenze.de/dsc



Brake switch

The brake switch comprises a rectifier and an electronic circuit breaker for switching an electromechanical brake. The brake switch is fitted inside the 8200 motec. It is controlled using a digital output from the standard or application I/O.

- In the 0.25 ... 2.2 kW power range the brake switch cannot be used in combination with bus I/O or system terminals.

Brake switch

Design	Features	Product key
	Brake switch	
Half-wave rectification	▶ for 0.55 ... 7.5 kW ▶ Input voltage: AC 320 ... 550 V ▶ Output voltage: DC 180 V (at AC 400 V), DC 225 V (at AC 500 V) ▶ Max. brake current: DC 0.61 A	E82ZWBRE
Bridge rectification	▶ for 0.55 ... 7.5 kW ▶ Input voltage: AC 180 ... 317 V ▶ Output voltage: DC 205 V (at AC 230 V) ▶ Max. brake current: DC 0.54 A	E82ZWBRB
	▶ for 0.25 ... 0.37 kW ▶ E82ZWBRB brake switch incl. terminal cradle ▶ Input voltage: AC 180 ... 264 V ▶ Output voltage: DC 205 V (at AC 230 V) ▶ Max. brake current: DC 0.41 A	E82ZMBRB

→ Data sheet on E82ZWBRE brake resistor
DS_Brake_8400_0001
Available for download at www.lenze.de/dsc

→ Data sheet on E82ZWBRB brake switch
DS_Brake_8400_0002
Available for download at www.lenze.de/dsc

→ Data sheet on E82ZMBRB brake switch
DS_Brake_8400_0003
Available for download at www.lenze.de/dsc

Switch/potentiometer unit

The switch/potentiometer unit is fitted on the 8200 motec itself or at another location in the plant. Using the switch/potentiometer unit and an I/O function module (standard I/O, application I/O, bus I/O) an analogue setpoint can be selected for the inverter with the integrated potentiometer; the rotary switch can be used to e.g. start or stop the drive or change the direction of rotation.
The switch/potentiometer unit is supplied with a 2.5 m connecting cable and fixings for mounting on the 8200 motec heatsink.

Switch/potentiometer unit

Design	Product key
Switch/potentiometer unit (IP65)	E82ZBU

→ Data sheet on switch/potentiometer unit iE82ZBU
DS_ZB_8200m_0001
Available for download at www.lenze.de/dsc

Switch unit

The switch unit is fitted in an M20 cable gland of the 8200 motec. A digital input can be used to e.g. start or stop the drive.

Switch unit

Design	Product key
Switch unit (IP55)	E82ZBS020

Fan module

The fan module is provided for 8200 motec in the power range 3.0 ... 7.5 kW and contains an electronic fan which is powered by the 8200 motec.
The fan module is needed when the

- 8200 motec is wall-mounted
- when using motors or geared motors which were not produced by Lenze.
- when using self-ventilated Lenze motors or geared motors which operate without reducing the rated output current.

Fan module

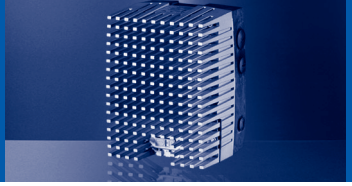
Design	Product key
Fan module (IP 54)	E82ZMV

Adapter plate

Adapter plates are available for fitting the 8200 motec on motors whose drilling pattern does not match the Lenze standard. The plates should be drilled by the user as required for the motor awaiting adaptation.

Adaptor plate

Design	Product key
Adapter plate 0.25 ... 0.37 kW	EJ0048
Adapter plate 0.55 ... 2.2 kW	EJ0047
Adapter plate 3.0 ... 7.5 kW	EJ0050



Overview of modules

The inverters have a slot for a module. The slot is inside the motec. Depending on application, it should be equipped with a corresponding module.

An extra bus function module can be used when using the bus I/O. The table below describes the modules available for this slot.

Design		Features	Slot	Product key
Function module				
Standard I/O		▶ 5 digital inputs ▶ 1 digital output ▶ 1 analog input ▶ 1 analog output ▶ Coated design for operation in industrial environments	FIF	E82ZAFSC001
Application I/O		▶ 7 digital inputs ▶ 2 digital outputs ▶ 2 analog inputs ▶ 2 analog outputs ▶ 1 frequency output ▶ Coated design for operation in industrial environments		E82ZAFAC001
AS-i		▶ 2 LED for communication status display ▶ 2 freely configurable digital inputs ▶ Coated design for operation in industrial environments		E82ZAFFC001
CAN		▶ Lenze system bus ▶ Coated design for operation in industrial environments		E82ZAFCC001
CAN I/O		▶ Lenze system bus ▶ 2 freely configurable digital inputs ▶ DIP switch for selecting baud rate and address ▶ Coated design for operation in industrial environments		E82ZAFCC201
CANopen		▶ Communication profile: CANopen DS301, V4.02 ▶ Lenze system bus ▶ 2 LED for communication status display ▶ DIP switch for selecting baud rate and address ▶ Coated design for operation in industrial environments		E82ZAFUC001
DeviceNet		▶ 2 LED for communication status display ▶ DIP switch for selecting baud rate and address ▶ Coated design for operation in industrial environments		E82ZAFVC001

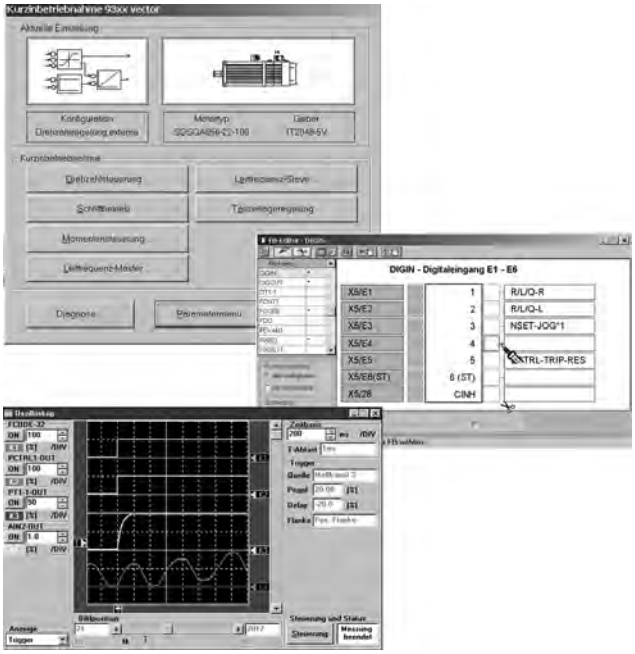
Overview of modules

Design		Features	Slot	Product key
Function module				
INTERBUS		▶ 2 LED for communication status display ▶ DIP switch for selecting the number of process and parameter data words ▶ Coated design for operation in industrial environments	FIF	E82ZAFIC001
LECOM-B		▶ RS 485 ▶ 2 LED for communication status display ▶ Coated design for operation in industrial environments		E82ZAFLC001
PROFIBUS		▶ Communication profile: PROFIBUS-DP-V0 ▶ 2 LED for communication status display ▶ Bus terminating resistor can be activated using DIP switch ▶ Coated design for operation in industrial environments		E82ZAFPC001
PROFIBUS I/O		▶ Communication profile: PROFIBUS-DP-V0 and -V1 ▶ 2 LED for communication status display ▶ 2 freely configurable digital inputs ▶ Bus terminating resistor can be activated using DIP switch ▶ DIP switch for address selection ▶ Coated design for operation in industrial environments		E82ZAFPC201

Selection and order data

The "Global Drive Control“ (GDC) PC program is a clear tool which is easy to understand. It is used for the operation, parameter setting, configuration and diagnostics of many Lenze drives and automation devices.
Advantages at a glance:

- quick and easy drive commissioning via short set-up
- intuitive operation even for inexperienced users
- extensive Help functions
- convenient diagnostics options using various monitor windows and oscilloscope functions make external measuring instruments superfluous
- the function blocks can be interconnected without any knowledge of how to program using the function block editor



User interfaces of Global Drive Control

Design	Features	Product key
Global Drive Control "easy", freeware	► Order free of charge ► Download via the Internet ► Includes GD Loader ► Languages: German/English	Download free of charge
GDC starter package	► Includes: - Global Drive Control, single user licence - USB system bus adapter	ESP-GDC-2S
Global Drive Control, single user licence	► CD-ROM included in scope of supply ► Installation on one PC ► Includes GD Loader and GD Oscilloscope ► Languages: German/English	ESP-GDC2
Global Drive Control, multiple user licence	► CD-ROM not included in scope of supply ► Multiple installations on the number of machines for which licences have been purchased ► The basis is a single user licence	ESPMGDC2
Global Drive Control, corporate licence	► CD-ROM not included in scope of supply ► Multiple installations within a company at one location ► The basis is a single user licence	ESPFGDC2
Global Drive Control, buyout licence	► CD-ROM not included in scope of supply ► Multiple installations within a company at one location ► Issuing of sublicences in conjunction with Lenze drives installed in a machine ► The basis is a single user licence	ESPBGDC2

Functions and features

The following table describes functions and features of the engineering software.

Since not all functions can be accessed by every drive, the engineering software appears differently, depending on the selected drive.

Product key Short form		**ESP□GDC2**
Design	**GDC easy**	**GDC**
Code list, access to all parameters		
STARTTEC	●	●
8200 vector / 8200 motec	●	●
9300 vector	●	●
9300 servo inverter	●	●
Drive PLC	●	●
9300 Servo PLC	●	●
ECS axis and power supply module	●	●
I/O system IP20	●	●
EthernetCAN	●	●
ModemCAN	●	●
Function block editor		
8200 vector / 8200 motec		●
9300 vector		●
9300 servo inverter		●
ECSxS (Speed & Torque)		●
Short setup dialogs		
STARTTEC	●	●
8200 vector / 8200 motec	●	●
9300 vector	●	●
9300 servo inverter		●
ECSxx		●
Assisted setup		
8200 vector / 8200 motec	●	●
Diagnostics		
Monitor window	●	●
Input / output diagnostics		
8200 vector / 8200 motec	●	●
Oscilloscope function		
9300 vector		●
9300 servo inverter		●
ECSxx		●
Additional integrated software		
Global Drive Oscilloscope		●
Global Drive Loader	●	●

Data access/communication

The following table describes the communication paths of the engineering software to the connected drives.
Some drives do not support all communication paths, so that some communication paths may not be possible.

Product key Short form		**ESP□GDC2**
Design	**GDC easy**	**GDC**
Version Latest software version	V4.10	
Communication System bus (CAN)	► USB connection with USB system bus adapter EMF 2177IB [1] ► Parallel interface with system bus adapter EMF 2173IB	
LECOM	► RS485 with interface converter (LECOM B) [2] ► Optical fibre via RS232 converter of PC (LECOM LI) ► RS232 (LECOM A)	
OPC Drive Server	► Via all connections defined on the OPC Drive Server (bus server)	

[1] Not valid for Windows NT®. This operating system does not support the USB port.
[2] Possible using one of the intelligent interface converters freely available on the market (not supplied by Lenze).

System requirements

To be able to use Global Drive Control, the following minimum hardware and software requirements must be met:

- Microsoft®Windows® 98/Me, Windows NT® 4.0 SP5 or higher or Windows 2000 SP2/XP or higher
- IBM compatible PC with Intel® Pentium® processor 333 MHz or higher
- At least 128 MB RAM
- At least 250 MB free hard disk space
- At least 1024 x 768 pixels screen resolution with 256 colours
- Mouse
- CD-ROM drive
- Internet Explorer Version 5 or higher
- Free slots/interfaces in accordance with the requirements of the individual fieldbus interface modules

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