L-force
Inverter Drives 8400

Precisely tailored to your application

Lenze

This is what we stand for.
You want to implement your machine and plant concepts efficiently and easily or optimise existing concepts to reduce costs? Then, Lenze is the partner you are looking for. For more than 60 years, drive and automation systems have been our core competence.

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, whilst 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.

L-force | Your future is our drive

L-force - your future is our drive
L-force is our new product philosophy introduced in response to the need to reduce costs, save time and increase efficiency. This generation of drive and automation technology sets innovation, flexibility, usability and system culture in perfect harmony.

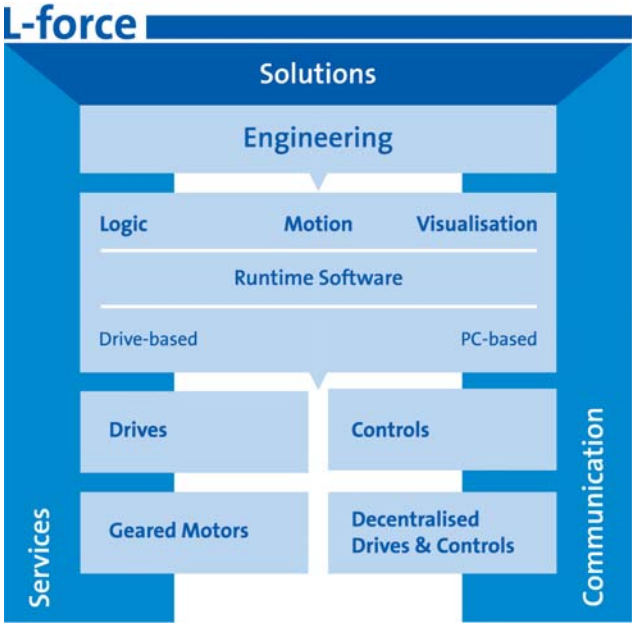
L-force is innovation
In order to offer you more options and (added) value, we are constantly working to improve our solution still further.

L-force means flexibility
Performance, functional range, software, technical services and after-sales service - you get exactly the combination you need.

L-force means usability
Commissioning is made easier thanks to preconfigured solutions and simple, function-based engineering.

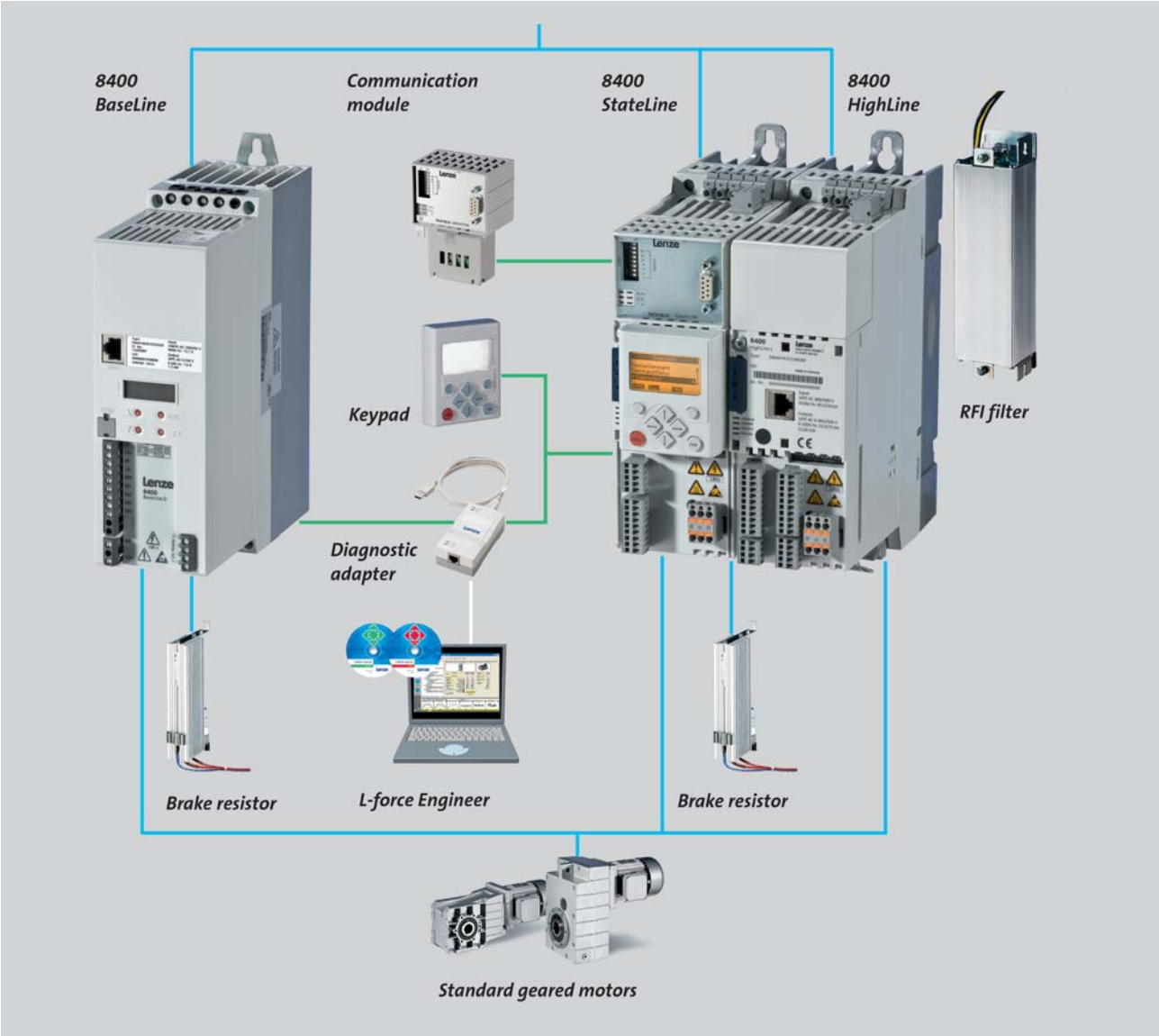
L-force means system
With L-force, everything is perfectly matched.

Let us help you shape your future.



L-force is an integrated range of components, solutions, systems and technical services. The overview shows the overall portfolio along with the individual product/solution segments.

System overview | 8400 Inverter Drives



Other catalogues

Frequency inverters and accessories of the L-force Inverter Drives 8400 series in the power range from 0.25 to 22 kW can be found in this catalogue. Additional components and system solutions can be found in the following catalogues:

- smd, 8200 vector, 8200 motec and 9300 vector frequency inverters up to 90 kW can be found in the frequency inverters catalogue
- Servo Drives 9400 up to 400 kW can be found in the Servo Drives 9400 catalogue
- Servo inverter 9300 and ECS servo system up to 75 kW can be found in the Servo Inverter catalogue
- Human-machine interfaces, I/O systems, remote maintenance components and other components relating to automation can be found in the PC-based Automation catalogue.
- You can find standard motors in the Three-Phase Motors catalogue.
- Standard geared motors are included in the G-motion const. catalogue

Contents | 8400 Inverter Drives

Product information

Inverter

Accessories

Contents | 8400 Inverter Drives

Modules

L-force Engineer

Lenze world-wide

Product key

E84AV S C E 751 2 S X 0

Design
BD – BaseLine D (0.25 ... 3.0 kW)
BC – BaseLine C (0.25 ... 3.0 kW) [1]
SC – StateLine C (0.25 ... 22.0 kW) [1]
HC – HighLine C (0.25 ... 22.0 kW) [1]

Mounting type
E – Built-in unit
D – Push-through technique (0.25 ... 15.0 kW) [2]
C – Cold plate technology (0.25 ... 15.0 kW) [2]

Power

251 – 0.25 kW	402 – 4.0 kW
371 – 0.37 kW	552 – 5.5 kW
551 – 0.55 kW	752 – 7.5 kW
751 – 0.75 kW	113 – 11.0 kW
112 – 1.1 kW	153 – 15.0 kW
152 – 1.5 kW	183 – 18.5 kW
222 – 2.2 kW	223 – 22.0 kW
302 – 3.0 kW	

Voltage class
2 – 230/240 V, 1/N/PE AC (0.25 ... 2.2 kW)
4 – 400/500 V, 3/PE AC (0.37 ... 22.0 kW)

Ambient conditions
S – Standard (0.25 ... 15.0 kW)
V – Harsh environment (coated printed circuit boards, 0.25 ... 22.0 kW) [2]

Safety engineering
X – Without safety engineering
B – With safety engineering (STO) [2]

[1] CANopen on board
[2] 8400 StateLine C and 8400 HighLine C

Equipment

Pluggable mains connection*

Pluggable connection DC-bus connection
(400 V types)

Pluggable relay connection*

Communication module*
optional

Safety engineering (STO)*
optional

Memory module
- pluggable
- contains all drive data

L-force diagnostics interface
for USB adapter with PC connection or keypad

Pluggable control terminals*
with spring contacts

CANopen on board
- DS301-compliant
- T plug

Integrated shield connection*
for the motor cable

Integrated shield connection
for control cables

Pluggable motor connection*

* for 8400 StateLine and HighLine

List of abbreviations

b	[mm]	Dimensions, Width
C_{th}	[KWs]	Thermal capacity,
f_{ch}	[kHz]	Rated switching frequency
h	[mm]	Dimensions, Height
$I_{max, out}$	[A]	Max. output current, 60 s
$I_{N, out}$	[A]	Rated output current,
$I_{N, AC}$	[A]	Rated mains current,
l_{max}	[m]	Max. cable length, Shielded motor cable
m	[kg]	Mass,
M_{max}	[Nm]	Max. torque,
n_{max}	[r/min]	Max. speed,
P	[kW]	Typical motor power, 4-pole asynchronous motor
P_V	[kW]	Power loss,
P_N	[kW]	Rated power,
R_N	[Ω]	Rated resistance,
t	[mm]	Dimensions, Depth
U_{AC}	[V]	Mains voltage,
U_{DC}	[V]	DC supply,
$U_{N, AC}$	[V]	Rated voltage, AC
U_{out}	[V]	Max. output voltage,

ASM	Asynchronous motor
DIAG	Slot for diagnostic adapter
DIN	Deutsches Institut für Normung e.V.
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
IEC	International Electrotechnical Commission
IEC 61508	Functional safety of electrical/electronic/programmable electronic safety-related systems
IM	International Mounting Code
IP	International Protection Code
MCI	Slot for communication module (module communication interface)
NEMA	National Electrical Manufacturers Association
UL	Underwriters Laboratory Listed Product
UR	Underwriters Laboratory Recognized Product
VDE	Verband deutscher Elektrotechniker (Association of German Electrical Engineers)

About this catalogue

This catalogue contains all the components that make up the Inverter Drives 8400 product range and is a document that you can use to select and order your products. You can find comprehensive project planning information in the Operating Instructions and System Manuals for the relevant products. The same product range is also covered in the DSC electronic catalogue, which is available on CD or online at: www.lenze.com/dsc
. You can also download additional information (e.g. rated data) for certain components from the Internet. These components are marked with the following arrow symbol and a corresponding identifier printed in bold.

→ Rated data and dimension sheets
DS_GD_8400_0001
Available for download at www.lenze.de/dsc

Just enter this identifier (e.g. **DS_8400_0001**) as the search term and you will get the information as a PDF file.

Inverters and accessories

All components of the 8400 Inverter Drive range can be selected easily and quickly via a uniform product key.
For improved clarity, wildcards are used to represent different product versions.

- The □ is used, for instance, to group different versions, e.g. E84AV□□E7512SX0, where □ is a wildcard for BC (BaseLine C), BD (BaseLine D), SC (StateLine C) or HC (HighLine C).

The rightsizing principle

The rightsizing principle
We call it rightsizing: The Inverter Drives 8400 are designed for consistent process optimisation – and this right along the value-added chain. They significantly reduce your costs and you work – from selection, configuration and manufacture, right up to commissioning and service.

Rightsized for more productivity
The versions of the 8400 series - BaseLine, StateLine und HighLine - match each other consistently in terms of functionality and drive behaviour. This is what makes selection so easy. At the same time, diagnostic terminals and tools, operator control and parameterisation, are identical in all versions. The 8400 series, for example, also makes full use of its strengths when different versions are used in your application.

Rightsized for the future
Later adaptations are not a problem. If the possibilities of a StateLine are no longer sufficient, all you have to do is quickly replace it with a HighLine – without having to redesign your control cabinet. The product is fit for future use for exacly this reason as well as thanks to its environmentally compatible method of production in accordance with ISO 14001 and RoHS.

Rightsized for a quick start
The inverters and the integrated shield connections are delivered completely preassembled, reducing the time you need to spend before and during assembly. The frequency inverter is adapted to your application selecting predefined applications. In the simplest case you can start by setting just two parameters, "Application" and "Setpoint source".

Rightsized for optimum operation
At the heart of our development of human machine interfaces is a consistent focus on the user. Whether you use the keypad or a PC, you will be working with intuitive menus that have been fine-tuned in practice to the very last detail.

Rightsized for quick service
Diagnostics and parameter setting by means of remote maintenance allow for quick and economic service worldwide. The memory module, integrated shield connections and pluggable terminals allow drives to be replaced quickly, thereby reducing machine downtimes.

Compliant RoHS 2002/95/EC

8400 StateLine with shield connections for control and motor cable extended

The rightsizing principle

Memory module
The memory module serves as the memory unit for all parameters. The pluggable memory chip can be parameterised via the frequency inverter itself or the PC. The parameter settings can then be copied onto any number of modules. The benefit for you is a marked increase in commissioning speed, especially in series machine building. The memory module also allows drives to be replaced quickly and without error.

Safety engineering
The 8400 StateLine and HighLine versions are available with the "safe torque off, STO" safety system as an optional extra. This helps to reduce control costs, save space in the control cabinet and streamline wiring. This safety system is certified to EN ISO 13849-1 (cat. 4, PL e), EN 61508/EN 62061 (SIL 3).

Online diagnostics
All 8400 versions include a standard, hot pluggable interface for easy operation, parameter setting and diagnostics. Data access and parameter modification are available even during operation – whether as a standalone device or networked via a fieldbus.

Standard features of all 8400 versions
- 150% overload current (60 s)
- 45 °C operating temperature without current derating (max. 55 °C)
- degree of protection IP20
- Memory module for fast commissioning and easy servicing
- L-force diagnostic interface for diagnostics and parameter setting, even during operation
- Integrated interference suppression in accordance with EN 61800-3
- Shield connection for control cables
- Automatic motor identification for optimum operational performance
- Protective functions to prevent short circuit, earth fault and motor stalling for safe operation

8400 BaseLine - for continuous motion
The BaseLine design is the entry-level model in terms of functionality and drive behaviour. Featuring an integrated keypad and everything you would expect from a modern frequency inverter suitable for universal use, the 8400 BaseLine is the ideal solution for applications such as conveyor drives, pumps, fans or ventilators.

8400 StateLine - for controlled movement
The 8400 StateLine is intended for drive control with or without speed feedback and is also used when networking via bus systems is needed. The integrated brake management system also delivers greatly reduced wear on the service brakes. Mains switching at too high a rate is also fine for the StateLine as the input circuit is protected from overload. The 8400 StateLine steps up from the BaseLine applications if these have to satisfy more stringent requirements. The StateLine is also perfectly suited to applications such as palletizers, extruders, filling systems or travelling/variable speed drives.

8400 HighLine - for positioning task
In addition to the features of the 8400 StateLine, the 8400 HighLine also offers integrated point-to-point positioning. This allows up to 15 position destinations, including the associated travel profile (e.g. acceleration) to be stored in the inverter. The master control is responsible for selecting these position records and specifying the process. The incremental encoder signal returned is evaluated by two digital inputs. The 8400 HighLine assumes the applications of the 8400 StateLine if these need to satisfy more stringent requirements. The 8400 HighLine is also recommended for applications such as rotary indexing tables, rolling and sliding doors and positioning tasks in warehouse systems.

8400 StateLine, push-through or cold plate technique

8400 StateLine with safety engineering

Functions and features

Type	8400 BaseLine	8400 StateLine
Control types, motor control	V/f control without encoder (linear or square-law) Sensorless vector control (torque/speed)	V/f control without encoder (linear or square-law) Sensorless vector control (torque/speed) V/f control with encoder
Basic functions	Application-oriented commissioning (predefined application) Freely assignable user menu Data logger DC brake function Flying restart circuit S-shaped ramps for smooth acceleration Max. output frequency 300 Hz PID controller 3 fixed frequencies 180 % overload current (3 s)	Application-oriented commissioning (predefined application) Freely assignable user menu Data logger DC brake function Flying restart circuit S-shaped ramps for smooth acceleration Max. output frequency 1000 Hz PID controller 15 fixed frequencies 200% overload current (3 s) Parameter change-over Masking frequencies Switch-off positioning (without encoder) Braking operation without brake resistor Brake management for brake control with low rate of wear Inversion of motor phase sequence Logic functions, comparator, arithmetic function Function block interconnection for input and output signals
Monitoring and protective measures	Short circuit Earth fault Overvoltage Motor stalling I² x t monitoring	Short circuit Earth fault Overvoltage Motor stalling I² x t monitoring Motor overtemperature (input for PTC or thermal contact) Motor phase failure Mains phase failure Protection against restart for cyclic mains switching
Diagnostics		
Diagnostic interface	Integrated For USB diagnostic adapter in PC connection	Integrated For USB diagnostic adapter with PC connection or X400 keypad
Status display	4 LEDs	4 LEDs
Braking operation		
Brake chopper	Integrated (400 V types)	Integrated
Brake resistor	External (400 V types)	External

Functions and features

Type	8400 HighLine
Control types, motor control	V/f control without encoder (linear or square-law) Sensorless vector control (torque/speed) V/f control with encoder Servo control (asynchronous motor)
Basic functions	Application-oriented commissioning (predefined application) Freely assignable user menu Data logger DC brake function Flying restart circuit S-shaped ramps for smooth acceleration Max. output frequency 1000 Hz PID controller 15 fixed frequencies 200% overload current (3 s) Parameter change-over Masking frequencies Switch-off positioning (without encoder) Braking operation without brake resistor Brake management for brake control with low rate of wear Inversion of motor phase sequence Logic functions, comparator, arithmetic function Function block interconnection for input and output signals Free function block interconnection Point-to-point positioning
Monitoring and protective measures	Short circuit Earth fault Overvoltage Motor stalling $I^2 \times t$ monitoring Motor overtemperature (input for PTC or thermal contact) Motor phase failure Mains phase failure Protection against restart for cyclic mains switching
Diagnostics	
Diagnostic interface	Integrated For USB diagnostic adapter with PC connection or X400 keypad
Status display	4 LEDs
Braking operation	
Brake chopper	Integrated
Brake resistor	External

Control connections

Type	8400 BaseLine	8400 StateLine	8400 HighLine
Analog inputs			
Number	1 Switchable: voltage or current input	1 Optional: voltage or current input	2 Optional: voltage or current input
Resolution	10 bits	10 bits	10 bits
Value range	0 ... 10V, 0/4 ... 20mA	0 ... +/- 10V, 0/4 ... 20mA	0 ... +/- 10V, 0/4 ... 20mA
Analog outputs			
Number		1	2 Optional: voltage or current output
Resolution		10 bits	10 bits
Value range		0 ... 10V	0 ... 10V, 0/4 ... 20mA
Digital inputs			
Number	5	5	8
Switching level	PLC (IEC 61131-2)	PLC (IEC 61131-2)	PLC (IEC 61131-2)
Max. input current	11mA	11mA	11mA
Function			2 inputs, can optionally be used as a frequency input (10 kHz, 2-track)
Digital outputs			
Number	1	1	4
Switching level	PLC (IEC 61131-2)	PLC (IEC 61131-2)	PLC (IEC 61131-2)
Max. output current	50mA	50mA	1 x 2.5A, (basic insulation, with spark suppressor, e.g. for 24 V service brake) 3 x 50mA
Relay			
Number	1	1	1
Contact	NO contact	Changeover contact	Changeover contact
AC connection	250V, 3A	250V, 3A	250V, 3A
DC connection	24V, 2A ... 240V, 0.16A	24V, 2A ... 240V, 0.16A	24V, 2A ... 240V, 0.16A
External DC supply [1)] Rated voltage		24 V	24 V
Interfaces			
CANopen	integrated (BaseLine C) Functional insulation Max. baud rate 500 kbps	Integrated Functional insulation Max. baud rate 500 kbps	Integrated Functional insulation Max. baud rate 1000 kbps
Extensions		Optional Communication module	Optional Communication module
Safety engineering		Optional "Safe Torque Off (STO)"	Optional "Safe Torque Off (STO)"
Drive interface			
Encoder input		Via 2 digital inputs HTL, 2-track Can also be used as a frequency input Limit frequency: 10 kHz	Via 2 digital inputs HTL, 2-track Can also be used as a frequency input Limit frequency: 10 kHz

[1)] To mains-independent control electronics supply

→ Circuit diagrams
DS_SP_8400_0001
Available for download at www.lenze.de/dsc

Standards and operating conditions

Conformity Type			CE: Low-Voltage Directive 2006/95/EC
Approval UL 508C [1]			Power Conversion Equipment (file no. E132659)
Certification			GOST-R
Enclosure EN 60529 [2] NEMA 250			IP20 Type 1
Climatic conditions Storage (EN 60721-3-1) Transport (EN 60721-3-2) Operation (EN 60721-3-3) Power reduction above 45 °C			1K3 (temperature: -25 °C ... +60 °C) 2K3 (temperature: -25 °C ... +70 °C) 3K3 (temperature: -10°C ... +55°C) 2.5% / K
Site altitude Amsl power reduction above 1000 m	H_{max}	[m] [%/1000 m]	4000 5.00
Vibration resistance Transport (EN 60721-3-2) Operation (EN 61800-5-1) Operation (Germanischer Lloyd)			2M2 10 Hz ≤ f ≤ 57 Hz: ± 0.075 mm amplitude, 57 Hz ≤ f ≤ 150 Hz: 1.0 g 5 Hz ≤ f ≤ 13.2 Hz: ± 1 mm amplitude, 13.2 Hz ≤ f ≤ 100 Hz: 0.7 g

[1] In preparation for 18.5 kW and 22 kW
[2] Mounted and ready-to-use

Supply form	Systems with earthed star point (TN and TT systems) Systems with high-resistance or isolated star point (IT systems) [3]
Noise emission EN 61800-3	Integrated RFI suppression: cable-guided, category C2 up to 25 m shielded motor cable [4]
Insulation resistance EN 61800-5-1	Overvoltage category III Above 2000 m amsl overvoltage category II
Degree of pollution EN 61800-5-1	2
Protective insulation of control circuits EN 61800-5-1	Safe mains isolation: double/reinforced insulation

[3] 8400 StateLine and 8400 HighLine
[4] Depending on the drive, shielded motor cable up to 50 m is possible

Rated data

- The data is valid for operation at 230 V AC.
- Unless otherwise specified, the data refers to the default setting.

→ Rated data and dimension sheets
DS_GD_8400_0001
Available for download at www.lenze.de/dsc

				
Typical motor power 4-pole asynchronous motor	**P**	[kW]	**0.25**	**0.37**
Product key [1]			**E84AV□□□2512□□0**	**E84AV□□□3712□□0**
Mains voltage range	U_{AC}	[V]	1/PE AC 180 V-0 % ... 264 V+0 %, 45 Hz-0 % ... 65 Hz+0 %	
DC supply	U_{DC}	[V]	not possible	
Rated output current [2]	$I_{N, out}$	[A]	1.70	2.40
Max. cable length [3]				
unshielded motor cable	I_{max}	[m]	100	
Shielded motor cable	I_{max}	[m]	50	

[1] → 8 - See product key – illustration features accessories/modules

[2] Overload: 150% * $I_{N, out}$ for 60 s, 200% (BaseLine 180%) * $I_{N, out}$ for 3 s
[3] Technically possible cable lengths, irrespective of EMC requirements

Dimensions

Dimensions - BaseLine

Dimensions				
Height	**h**	[mm]	165	165
Width	**b**	[mm]	70	70
Depth [4]	**t**	[mm]	144	144

[4] Depth of 8400 BaseLine with CANopen (BaseLine C), additional 8 mm

Dimensions - built-in unit StateLine, HighLine

Dimensions				
Height	**h**	[mm]	165	165
Width	**b**	[mm]	70	70
Depth [5]	**t**	[mm]	199	199

[5] Depth of 8400 StateLine and HighLine with safety engineering, add. 20 mm

Dimensions - Cold Plate StateLine, HighLine

Dimensions				
Height, including fastening	**h**	[mm]	186	186
Width, including fastening	**b**	[mm]	102	102
Depth [5]	**t**	[mm]	185	185

Dimensions of push-through technique for StateLine, HighLine

Dimensions				
Height, including fastening	**h**	[mm]	186	186
Width, including fastening	**b**	[mm]	102	102
Depth (on control cabinet side) [5]	**t**	[mm]	185	185

Rated data

- The data is valid for operation at 230 V AC.
- Unless otherwise specified, the data refers to the default setting.

→ Rated data and dimension sheets
DS_GD_8400_0001
Available for download at www.lenze.de/dsc

Typical motor power 4-pole asynchronous motor	**P**	[kW]	**0.55**	**0.75**
Product key [1]			**E84AV□□□5512□□0**	**E84AV□□□7512□□0**
Mains voltage range	U_{AC}	[V]	1/PE AC 180 V-0 % ... 264 V+0 %, 45 Hz-0 % ... 65 Hz+0 %	
DC supply	U_{DC}	[V]	not possible	
Rated output current [2]	$I_{N, out}$	[A]	3.00	4.00
Max. cable length [3]				
unshielded motor cable	I_{max}	[m]	100	
Shielded motor cable	I_{max}	[m]	50	

[1] → 8 - See product key – illustration features accessories/modules

[2] Overload: 150% * $I_{N, out}$ for 60 s, 200% (BaseLine 180%) * $I_{N, out}$ for 3 s
[3] Technically possible cable lengths, irrespective of EMC requirements

Dimensions

Dimensions - BaseLine

Dimensions				
Height	**h**	[mm]	165	165
Width	**b**	[mm]	70	70
Depth [4]	**t**	[mm]	162	162

[4] Depth of 8400 BaseLine with CANopen (BaseLine C), additional 8 mm

Dimensions - built-in unit StateLine, HighLine

Dimensions				
Height	**h**	[mm]	215	215
Width	**b**	[mm]	70	70
Depth [5]	**t**	[mm]	199	199

[5] Depth of 8400 StateLine and HighLine with safety engineering, add. 20 mm

Dimensions - Cold Plate StateLine, HighLine

Dimensions				
Height, including fastening	**h**	[mm]	236	236
Width, including fastening	**b**	[mm]	102	102
Depth [5]	**t**	[mm]	163	163

Dimensions of push-through technique for StateLine, HighLine

Dimensions				
Height, including fastening	**h**	[mm]	236	236
Width, including fastening	**b**	[mm]	102	102
Depth (on control cabinet side) [5]	**t**	[mm]	163	163

Rated data

- The data is valid for operation at 230 V AC.
- Unless otherwise specified, the data refers to the default setting.

→ Rated data and dimension sheets
DS_GD_8400_0001
Available for download at www.lenze.de/dsc

Typical motor power 4-pole asynchronous motor	**P**	[kW]	**1.10**	**1.50**	**2.20**
Product key [1]			**E84AV□□□1122□□0**	**E84AV□□□1522□□0**	**E84AV□□□2222□□0**
Mains voltage range	U_{AC}	[V]	1/PE AC 180 V-0 % ... 264 V+0 %, 45 Hz-0 % ... 65 Hz+0 %		
DC supply	U_{DC}	[V]	not possible		
Rated output current [2]	$I_{N, out}$	[A]	5.50	7.00	9.50
Max. cable length [3] unshielded motor cable	I_{max}	[m]	100		
Shielded motor cable	I_{max}	[m]	50		

[1] → 8 - See product key – illustration features accessories/modules

[2] Overload: 150% * $I_{N, out}$ for 60 s, 200% (BaseLine 180%) * $I_{N, out}$ for 3 s
[3] Technically possible cable lengths, irrespective of EMC requirements

Dimensions

Dimensions - BaseLine

Dimensions					
Height	**h**	[mm]	165	215	215
Width	**b**	[mm]	70	70	70
Depth [4]	**t**	[mm]	162	162	162

[4] Depth of 8400 BaseLine with CANopen (BaseLine C), additional 8 mm

Dimensions - built-in unit StateLine, HighLine

Dimensions					
Height	**h**	[mm]	270	270	270
Width	**b**	[mm]	70	70	70
Depth [5]	**t**	[mm]	199	199	199

[5] Depth of 8400 StateLine and HighLine with safety engineering, add. 20 mm

Dimensions - Cold Plate StateLine, HighLine

Dimensions					
Height, including fastening	**h**	[mm]	295	295	295
Width, including fastening	**b**	[mm]	137	137	137
Depth [5]	**t**	[mm]	163	163	163

Dimensions of push-through technique for StateLine, HighLine

Dimensions					
Height, including fastening	**h**	[mm]	295	295	295
Width, including fastening	**b**	[mm]	137	137	137
Depth (on control cabinet side) [5]	**t**	[mm]	163	163	163

Rated data

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

→ Rated data and dimension sheets
DS_GD_8400_0002
Available for download at www.lenze.de/dsc

Typical motor power 4-pole asynchronous motor	**P**	[kW]	**0.37**	**0.55**	**0.75**
Product key [1]			**E84AV□□□3714□□0**	**E84AV□□□5514□□0**	**E84AV□□□7514□□0**
Mains voltage range	U_{AC}	[V]	3/PE AC 320 V-0 % ... 550 V+0 %, 45 Hz-0 % ... 65 Hz+0 %		
DC supply [3]	U_{DC}	[V]	DC 450 V -0 % ... 775 V +0 %		
Rated output current [2]	$I_{N, out}$	[A]	1.30	1.80	2.40
Max. cable length [4] unshielded motor cable	I_{max}	[m]	100		
Shielded motor cable	I_{max}	[m]	50		

[1] → 8 - See product key – illustration features accessories/modules

[2] Overload: 150% * $I_{N, out}$ for 60 s, 200% (BaseLine 180%) * $I_{N, out}$ for 3 s
[3] 8400 BaseLine: A connector is required (order designation: EWS0074/M)
[4] Technically possible cable lengths, irrespective of EMC requirements

Dimensions

Dimensions - BaseLine

Dimensions					
Height	**h**	[mm]	165	165	165
Width	**b**	[mm]	70	70	70
Depth [5]	**t**	[mm]	162	162	162

[5] Depth of 8400 BaseLine with CANopen (BaseLine C), additional 8 mm

Dimensions - built-in unit StateLine, HighLine

Dimensions					
Height	**h**	[mm]	215	215	215
Width	**b**	[mm]	70	70	70
Depth [6]	**t**	[mm]	199	199	199

[6] Depth of 8400 StateLine and HighLine with safety engineering, add. 20 mm

Dimensions - Cold Plate StateLine, HighLine

Dimensions					
Height, including fastening	**h**	[mm]	236	236	236
Width, including fastening	**b**	[mm]	102	102	102
Depth [6]	**t**	[mm]	163	163	163

Dimensions of push-through technique for StateLine, HighLine

Dimensions					
Height, including fastening	**h**	[mm]	236	236	236
Width, including fastening	**b**	[mm]	102	102	102
Depth (on control cabinet side) [6]	**t**	[mm]	163	163	163

Rated data

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

→ Rated data and dimension sheets
DS_GD_8400_0002
Available for download at www.lenze.de/dsc

Typical motor power 4-pole asynchronous motor	**P**	[kW]	**1.10**	**1.50**	**2.20**
Product key [1]			**E84AV□□□1124□□0**	**E84AV□□□1524□□0**	**E84AV□□□2224□□0**
Mains voltage range	U_{AC}	[V]	3/PE AC 320 V-0 % ... 550 V+0 %, 45 Hz-0 % ... 65 Hz+0 %		
DC supply [3]	U_{DC}	[V]	DC 450 V -0 % ... 775 V +0 %		
Rated output current [2]	$I_{N, out}$	[A]	3.20	3.90	5.90
Max. cable length [4] unshielded motor cable	I_{max}	[m]	100		
Shielded motor cable	I_{max}	[m]	50		

[1] → 8 - See product key – illustration features accessories/modules

[2] Overload: 150% * $I_{N, out}$ for 60 s, 200% (BaseLine 180%) * $I_{N, out}$ for 3 s
[3] 8400 BaseLine: A connector is required (order designation: EWS0074/M)
[4] Technically possible cable lengths, irrespective of EMC requirements

Dimensions

Dimensions - BaseLine

Dimensions					
Height	**h**	[mm]	165	165	215
Width	**b**	[mm]	70	70	70
Depth [5]	**t**	[mm]	162	162	162

[5] Depth of 8400 BaseLine with CANopen (BaseLine C), additional 8 mm

Dimensions - built-in unit StateLine, HighLine

Dimensions					
Height	**h**	[mm]	270	270	270
Width	**b**	[mm]	70	70	70
Depth [6]	**t**	[mm]	199	199	199

[6] Depth of 8400 StateLine and HighLine with safety engineering, add. 20 mm

Dimensions - Cold Plate StateLine, HighLine

Dimensions					
Height, including fastening	**h**	[mm]	295	295	295
Width, including fastening	**b**	[mm]	137	137	137
Depth [6]	**t**	[mm]	163	163	163

Dimensions of push-through technique for StateLine, HighLine

Dimensions					
Height, including fastening	**h**	[mm]	295	295	295
Width, including fastening	**b**	[mm]	137	137	137
Depth (on control cabinet side) [6]	**t**	[mm]	163	163	163

Rated data

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

→ Rated data and dimension sheets
DS_GD_8400_0002
Available for download at www.lenze.de/dsc

Typical motor power 4-pole asynchronous motor	**P**	[kW]	**3.00**	**4.00**	**5.50**
Product key [1]			**E84AV□□□3024□□0**	**E84AV□□□4024□□0**	**E84AV□□□5524□□0**
Mains voltage range	U_{AC}	[V]	3/PE AC 320 V-0 % ... 550 V+0 %, 45 Hz-0 % ... 65 Hz+0 %		
DC supply [3]	U_{DC}	[V]	DC 450 V -0 % ... 775 V +0 %		
Rated output current [2]	$I_{N, out}$	[A]	7.30	9.50	13.0
Max. cable length [4] unshielded motor cable	I_{max}	[m]	100		
Shielded motor cable	I_{max}	[m]	50		

[1] → 8 - See product key – illustration features accessories/modules

[2] Overload: 150% * $I_{N, out}$ for 60 s, 200% (BaseLine 180%) * $I_{N, out}$ for 3 s
[3] 8400 BaseLine: A connector is required (order designation: EWS0074/M)
[4] Technically possible cable lengths, irrespective of EMC requirements

Dimensions

Dimensions - BaseLine

Dimensions					
Height	**h**	[mm]	215		
Width	**b**	[mm]	70	-	-
Depth [5]	**t**	[mm]	162		

[5] Depth of 8400 BaseLine with CANopen (BaseLine C), additional 8 mm

Dimensions - built-in unit StateLine, HighLine

Dimensions					
Height	**h**	[mm]	270	270	270
Width	**b**	[mm]	140	140	140
Depth [6]	**t**	[mm]	199	199	199

[6] Depth of 8400 StateLine and HighLine with safety engineering, add. 20 mm

Dimensions - Cold Plate StateLine, HighLine

Dimensions					
Height, including fastening	**h**	[mm]	321	321	321
Width, including fastening	**b**	[mm]	174	174	174
Depth [6]	**t**	[mm]	141	141	141

Dimensions of push-through technique for StateLine, HighLine

Dimensions					
Height, including fastening	**h**	[mm]	321	321	321
Width, including fastening	**b**	[mm]	174	174	174
Depth (on control cabinet side) [6]	**t**	[mm]	141	141	141

Rated data

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

→ Rated data and dimension sheets
DS_GD_8400_0002
Available for download at www.lenze.de/dsc

Typical motor power 4-pole asynchronous motor	**P**	[kW]	**7.50**	**11.0**	**15.0** [3]
Product key [1]			**E84AV□□□7524□□0**	**E84AV□□□1134□□0**	**E84AV□□□1534□□0**
Mains voltage range	U_{AC}	[V]	3/PE AC 320 V-0 % ... 550 V+0 %, 45 Hz-0 % ... 65 Hz+0 %		
DC supply	U_{DC}	[V]	DC 450 V -0 % ... 775 V +0 %		
Rated output current [2]	$I_{N, out}$	[A]	16.5	23.5	32.0
Max. cable length [4] unshielded motor cable	I_{max}	[m]	100		
Shielded motor cable	I_{max}	[m]	50		

[1] → 8 - See product key – illustration features accessories/modules

[2] Overload: 150% * I_r for 60 s, 200% * I_r for 3 s
[3] Operation only permitted with mains choke
[4] Technically possible cable lengths, irrespective of EMC requirements

Dimensions

Dimensions - built-in unit StateLine, HighLine

Dimensions					
Height	**h**	[mm]	325	325	325
Width	**b**	[mm]	140	140	140
Depth [5]	**t**	[mm]	199	199	199

[5] Depth of 8400 StateLine and HighLine with safety engineering, add. 20 mm

Dimensions - Cold Plate StateLine, HighLine

Dimensions					
Height, including fastening	**h**	[mm]	381	381	381
Width, including fastening	**b**	[mm]	174	174	174
Depth [5]	**t**	[mm]	141	141	141

Dimensions of push-through technique for StateLine, HighLine

Dimensions					
Height, including fastening	**h**	[mm]	381	381	381
Width, including fastening	**b**	[mm]	174	174	174
Depth (on control cabinet side) [5]	**t**	[mm]	141	141	141

Rated data

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

→ Rated data and dimension sheets
DS_GD_8400_0002
Available for download at www.lenze.de/dsc

Typical motor power 4-pole asynchronous motor	**P**	[kW]	**18.5**	**22.0** [3]
Product key [1]			**E84AV□□□1834□□0**	**E84AV□□□2234□□0**
Mains voltage range	U_{AC}	[V]	3/PE AC 320 V-0 % ... 550 V+0 %, 45 Hz-0 % ... 65 Hz+0 %	
DC supply	U_{DC}	[V]	DC 450 V -0 % ... 775 V +0 %	
Rated output current [2]	$I_{N, out}$	[A]	39.0	47.0
Max. cable length [4] unshielded motor cable	I_{max}	[m]	100	
Shielded motor cable	I_{max}	[m]	100	

[1] → 8 - See product key – illustration features accessories/modules

[2] Overload: 150% * I_r for 60 s, 200% * I_r for 3 s
[3] Operation only permitted with mains choke or mains filter
[4] Technically possible cable lengths, irrespective of EMC requirements

Dimensions

Dimensions - built-in unit StateLine, HighLine

Dimensions				
Height	**h**	[mm]	350	350
Width	**b**	[mm]	204	204
Depth [5]	**t**	[mm]	250	250

[5] Depth of 8400 StateLine and HighLine with safety engineering, add. 20 mm

Weights

- The weights given are for standard drives without built-on accessories and without packaging.

Type	Product key	Mass
		m
		[kg]
8400 BaseLine	E84AV□□□2512□□0	1.20
	E84AV□□□3712□□0	
	E84AV□□□5512□□0	
	E84AV□□□7512□□0	
	E84AV□□□1122□□0	1.40
	E84AV□□□1522□□0	1.90
	E84AV□□□2222□□0	
	E84AV□□□3714□□0	1.20
	E84AV□□□5514□□0	
	E84AV□□□7514□□0	
	E84AV□□□1124□□0	1.40
	E84AV□□□1524□□0	
	E84AV□□□2224□□0	1.90
	E84AV□□□3024□□0	2.10

Type	Product key	Mass
		m
		[kg]
8400 StateLine	E84AV□□□2512□□0	1.30
	E84AV□□□3712□□0	
	E84AV□□□5512□□0	1.80
	E84AV□□□7512□□0	
	E84AV□□□1122□□0	2.10
	E84AV□□□1522□□0	
	E84AV□□□2222□□0	
	E84AV□□□3714□□0	1.80
	E84AV□□□5514□□0	
	E84AV□□□7514□□0	
	E84AV□□□1124□□0	2.10
	E84AV□□□1524□□0	
	E84AV□□□2224□□0	
	E84AV□□□3024□□0	4.40
	E84AV□□□4024□□0	
	E84AV□□□5524□□0	
	E84AV□□□7524□□0	5.80
	E84AV□□□1134□□0	
	E84AV□□□1534□□0	
	E84AV□□□1834□□0	12.0
	E84AV□□□2234□□0	

Type	Product key	Mass
		m
		[kg]
8400 HighLine	E84AV□□□2512□□0	1.30
	E84AV□□□3712□□0	
	E84AV□□□5512□□0	1.80
	E84AV□□□7512□□0	
	E84AV□□□1122□□0	2.10
	E84AV□□□1522□□0	
	E84AV□□□2222□□0	
	E84AV□□□3714□□0	1.80
	E84AV□□□5514□□0	
	E84AV□□□7514□□0	
	E84AV□□□1124□□0	2.10
	E84AV□□□1524□□0	
	E84AV□□□2224□□0	
	E84AV□□□3024□□0	4.40
	E84AV□□□4024□□0	
	E84AV□□□5524□□0	
	E84AV□□□7524□□0	5.80
	E84AV□□□1134□□0	
	E84AV□□□1534□□0	
	E84AV□□□1834□□0	12.0
	E84AV□□□2234□□0	

- Push-through technique: + 0.100 kg
  Safety engineering: + 0.100 kg
  Communication module: + 0.200 kg

Brake resistors

An external brake resistor is required to brake high moments of inertia or in the event of prolonged operation in generator mode; this resistor converts braking energy into heat.

The brake resistors recommended in the table below have been dimensioned for approx. 1.5 times the regenerative power, with a cycle time of 15/135 s (brake/rest ratio). These brake resistors generally meet the usual requirements of standard applications.

The brake resistors are fitted with a thermostat (potential-free NC contact).

ERBM...(IP50) brake resistor

Typical motor power	Mains voltage	Product key		Rated resistance	Rated power	Thermal capacity	Dimensions	Mass
4-pole asynchronous motor		Inverter	Brake resistor					
P	U_{AC}			R_N	P_N	C_{th}	h x b x t	m
[kW]	[V]			[Ω]	[W]	[KWs]	[mm]	[kg]
0.25	1 AC 180 ... 264	E84AV□□□2512□□0	ERBM180R050W	180.0	50.0	8	175 x 21 x 40	0.28
0.37		E84AV□□□3712□□0						
0.55		E84AV□□□5512□□0	ERBM100R100W	100.0	100.0	15	240 x 80 x 95	0.50
0.75		E84AV□□□7512□□0						
1.10		E84AV□□□1122□□0	ERBP033R200W	33.0	200.0	30	240 x 41 x 122	1.00
1.50		E84AV□□□1522□□0						
2.20		E84AV□□□2222□□0	ERBP033R300W		300.0	45	320 x 41 x 122	1.40
0.37	3 AC 320 ... 550	E84AV□□□3714□□0	ERBM390R100W	390.0	100.0	15	235 x 21 x 40	0.37
0.55		E84AV□□□5514□□0						
0.75		E84AV□□□7514□□0						
1.10		E84AV□□□1124□□0	ERBP180R200W	180.0	200.0	30	240 x 41 x 122	1.00
1.50		E84AV□□□1524□□0						
2.20		E84AV□□□2224□□0	ERBP180R300W		300.0	45	320 x 41 x 122	1.40

► The brake resistor is directly connected to the frequency inverter. A connector (order designation: EWS0074/M) is required for the 8400 BaseLine (400 V drives) for this purpose.

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

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

Brake resistors

For standard applications we recommend the following combinations:
E84AV□□□3024□□0 and ERBP180R300W
E84AV□□□4024□□0 and ERBS047R400W
E84AV□□□5524□□0 and ERBS047R800W
E84AV□□□7524□□0 and ERBS027R01K2
E84AV□□□1134□□0 and ERBS027R01K2
E84AV□□□1534□□0 and ERBS018R01K4.
With inverter E84AV□□□3024□□0 only brake resistor ERBP180R300W can be used for 8400 BaseLine.
Other possible combinations:

ERBP...(IP21) and ERBS...(IP65) brake resistor

Typical motor power	Mains voltage	Product key		Rated resistance	Rated power	Thermal capacity	Dimensions	Mass
4-pole asynchronous motor		Inverter	Brake resistor					
P	U_{AC}			R_N	P_N	C_{th}	h x b x t	m
[kW]	[V]			[Ω]	[W]	[KWs]	[mm]	[kg]
3.00	3 AC 320 ... 550	E84AV□□□3024□□0	ERBP180R300W	180.0	300.0	45	320 x 41 x 122	1.40
			ERBP047R200W	47.0	200.0	30		1.00
			ERBS047R400W		400.0	60	400 x 110 x 105	2.30
4.00		E84AV□□□4024□□0	ERBP047R200W		200.0	30	320 x 41 x 122	1.00
			ERBS047R400W		400.0	60	400 x 110 x 105	2.30
			ERBS047R800W		800.0	120	710 x 110 x 105	3.90
5.50		E84AV□□□5524□□0	ERBP047R200W		200.0	30	320 x 41 x 122	1.00
			ERBS047R400W		400.0	60	400 x 110 x 105	2.30
			ERBS047R800W		800.0	120	710 x 110 x 105	3.90
7.50		E84AV□□□7524□□0	ERBP027R200W	27.0	200.0	30	320 x 41 x 122	1.00
			ERBS027R600W		600.0	90	550 x 110 x 105	3.10
			ERBS027R01K2		1200.0	180	1020 x 110 x 105	5.60
11.0		E84AV□□□1134□□0	ERBP027R200W		200.0	30	320 x 41 x 122	1.00
			ERBS027R600W		600.0	90	550 x 110 x 105	3.10
			ERBS027R01K2		1200.0	180	1020 x 110 x 105	5.60
15.0		E84AV□□□1534□□0	ERBS018R800W	18.0	800.0	120	710 x 110 x 105	3.90
			ERBS018R01K4		1400.0	210	1110 x 110 x 105	6.20
			ERBS018R02K8		2800.0	420	1110 x 200 x 105	12.0
18.5		E84AV□□□1834□□0	ERBS015R800W	15.0	800.0	120	380 x 736 x 302	3.90
			ERBS015R01K2		1200.0	180	1020 x 110 x 105	5.60
			ERBS015R02K4		2400.0	420	380 x 326 x 302	10.0
22.0		E84AV□□□2234□□0	ERBS015R800W		800.0	120	380 x 736 x 302	3.90
			ERBS015R01K2		1200.0	180	1020 x 110 x 105	5.60
			ERBS015R02K4		2400.0	420	380 x 326 x 302	10.0

► The brake resistor is directly connected to the frequency inverter. A connector (order designation: EWS0074/M) is required for the 8400 BaseLine (400 V drives) for this purpose.

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

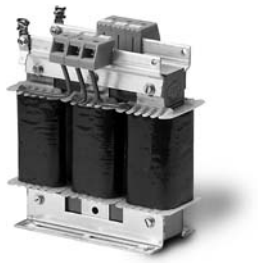
Data sheet on ERBS brake resistors
DS_ZB_ERBS_0001
Available for download at www.lenze.com/dsc

Mains chokes

A mains choke is an inductor that is connected to the mains cable of the inverter. Using a mains choke offers the following advantages:

- **Less system perturbation:**
  The wave form of the mains current is a closer approximation of a sine wave.
- **Reduced r.m.s. mains current:**
  Reduction in mains, cable and fuse load

A mains choke can be used without restriction together with RFI filters and/or sinusoidal filters.



Mains choke

Please note:
Using a mains choke slightly reduces the mains voltage at the inverter input - the typical voltage drop on the mains choke at the rated point is approximately 5 %.

Typical motor power	Mains voltage	Product key		Rated current	Dimensions	Mass
4-pole asynchronous motor		Inverter	Mains choke			
P	U_{AC}			I_N	h x b x t	m
[kW]	[V]			[A]	[mm]	[kg]
0.25	1 AC 180 ... 264	E84AV□□□2512□□0	ELN1-0900H005	5.00	80 x 66 x 67	2.30
0.37		E84AV□□□3712□□0				
0.55		E84AV□□□5512□□0	ELN1-0500H009	9.00		1.00
0.75		E84AV□□□7512□□0				
1.10		E84AV□□□1122□□0	ELN1-0250H018	18.0	98 x 61 x 97	2.30
1.50		E84AV□□□1522□□0				
2.20		E84AV□□□2222□□0				
0.37	3 AC 320 ... 550	E84AV□□□3714□□0	ELN3-1500H003-001	2.50	115 x 95 x 82	1.10
0.55		E84AV□□□5514□□0				
0.75		E84AV□□□7514□□0				
1.10		E84AV□□□1124□□0	ELN3-0680H006-001	6.10	126 x 120 x 70	2.00
1.50		E84AV□□□1524□□0				
2.20		E84AV□□□2224□□0				
3.00		E84AV□□□3024□□0	ELN3-0500H007-001	7.00	138 x 119 x 95	2.54
4.00		E84AV□□□4024□□0	ELN3-0250H013-001	13.0	120 x 65 x 117	5.20
5.50		E84AV□□□5524□□0				
7.50		E84AV□□□7524□□0	ELN3-0170H017-001	17.0	178 x 75 x 140	3.90
11.0		E84AV□□□1134□□0	ELN3-0150H024-001	24.0	192 x 180 x 120	7.70
15.0		E84AV□□□1534□□0 [1]	ELN3-0088H035-001	35.0	219 x 135 x 225	9.80
18.5		E84AV□□□1834□□0	ELN3-0075H045-001	45.0	245 x 190 x 150	10.0
22.0		E84AV□□□2234□□0 [2]				

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

RFI filter

RFI filters are used to ensure compliance with the EMC requirements set out in European standard EN 61800-3. The standard divides EMC requirements for electrical drive systems into various categories.
Category C1 is applicable in public networks (residential areas). With regard to limit values, category C1 corresponds to class B set out in EN 55011.
Category C2 is applicable in industrial premises; use in residential areas is left to the user's discretion. With regard to limit values, category C2 corresponds to class A set out in EN 55011.
If there are increased requirements regarding emitted interference and these cannot be satisfied with the radio-interference suppression measures already integrated in the inverter, you can use external filters. The filters are suitable as side-mounted or footprint filters.

Three different RFI filters are available:
LL filters (Low Leakage)
- Discharge current < 3.5 mA for a 5 m shielded motor cable enables installation in temporary installations
- Category C1 for 5 m shielded motor cable

RFI filter

SD (Short Distance) RFI filter)
- Low discharge current, e.g. for operation connected in circuit with a 30 mA earth-leakage circuit breaker in the case of a 25 m shielded motor cable
- Category C1 for a 25 m shielded motor cable
- Category C2 for a 50 m shielded motor cable

LD (long distance) RFI filter
- suitable for operation connected in circuit with a 300 mA earth-leakage circuit breaker in the case of a 50 m shield motor cable
- Category C1 for 50 m shielded motor cable
- Category C2 for 100 m shielded motor cable (in the case of 400 V devices, up to 15 kW only with sine filter)

Note:
The indicated motor cable lengths are maximum values.

Typical motor power	Mains voltage	Product key		Rated current	Dimensions	Mass
4-pole asynchronous motor		Inverter [1]	RFI filter			
P	U_{AC}			I_N	h x b x t	m
[kW]	[V]			[A]	[mm]	[kg]
0.25	1 AC 180 ... 264	E84AV□□□2512□□0	E84AZESR3712LL	5.00	212 x 70 x 60	0.80
			E84AZESR3712SD			
			E84AZESR3712LD			
0.37		E84AV□□□3712□□0	E84AZESR3712LL			
			E84AZESR3712SD			
			E84AZESR3712LD			
0.55		E84AV□□□5512□□0	E84AZESR5512LL	6.00	262 x 70 x 60	1.00
			E84AZESR7512SD	9.00		
			E84AZESR7512LD			
0.75		E84AV□□□7512□□0	E84AZESR7512LL			
			E84AZESR7512SD			
			E84AZESR7512LD			
1.10		E84AV□□□1122□□0	E84AZESR2222LL	22.0	317 x 70 x 60	1.40
			E84AZESR2222SD			1.70
			E84AZESR2222LD			1.50
1.50		E84AV□□□1522□□0	E84AZESR2222LL			1.40
			E84AZESR2222SD			1.70
			E84AZESR2222LD			1.50
2.20		E84AV□□□2222□□0	E84AZESR2222LL			1.40
			E84AZESR2222SD			1.70
			E84AZESR2222LD			1.50

[1] 8400 StateLine and 8400 HighLine

RFI filter

Typical motor power	Mains voltage	Product key		Rated current	Dimensions	Mass
4-pole asynchron-ous motor		Inverter [1]	RFI filter			
P	U_{AC}			I_N	h x b x t	m
[kW]	[V]			[A]	[mm]	[kg]
0.37	3 AC 320 ... 550	E84AV□□□3714□□0	E84AZESR7514SD	3.30	262 x 70 x 60	1.10
			E84AZESR7514LD			
0.55		E84AV□□□5514□□0	E84AZESR7514SD			
			E84AZESR7514LD			
0.75		E84AV□□□7514□□0	E84AZESR7514SD			
			E84AZESR7514LD			
1.10		E84AV□□□1124□□0	E84AZESR2224SD	7.30	317 x 70 x 60	1.50
			E84AZESR2224LD			1.40
1.50		E84AV□□□1524□□0	E84AZESR2224SD			1.50
			E84AZESR2224LD			1.40
2.20		E84AV□□□2224□□0	E84AZESR2224SD			1.50
			E84AZESR2224LD			1.40
3.00		E84AV□□□3024□□0	E84AZESR5524SD	18.0	306 x 140 x 60	3.10
			E84AZESR5524LD			2.20
4.00		E84AV□□□4024□□0	E84AZESR5524SD			3.10
			E84AZESR5524LD			2.20
5.50		E84AV□□□5524□□0	E84AZESR5524SD			3.10
			E84AZESR5524LD			2.20
7.50		E84AV□□□7524□□0	E84AZESR1534LD	29.0	361 x 140 x 60	3.30
11.0		E84AV□□□1134□□0				
15.0		E84AV□□□1534□□0				

[1] 8400 StateLine and 8400 HighLine

→ Data sheet on RFI filters
DS_ZB_SR_0001
Available for download at www.lenze.de/dsc

24 V power supply unit

External power supply units can be used as an alternative external supply for the control electronics of the 8400 StateLine or 8400 HighLine. The advantages of an external power supply is that the inverter can be parameterised and diagnosed when the mains input is deenergised.

24 V power supply unit

Rated data

Product key			EZV1200-000	EZV2400-000	EZV4800-000	EZV1200-001	EZV2400-001	EZV4800-001
Rated voltage AC	$U_{N, AC}$	[V]	230			400		
Rated mains current	$I_{N, AC}$	[A]	0.84	1.20	2.30	0.34	0.57	1.00
Output voltage	U_{out}	[V]	DC 22.5 ...28.5					
Rated current	I_N	[A]	5.00	10.0	20.0	5.00	10.0	20.0
Dimensions Height	**h**	[mm]	130					
Width	**b**	[mm]	55	85	157	73	85	160
Depth	**t**	[mm]	125					
Mass	**m**	[kg]	0.80	1.24	2.48	0.95	1.10	1.93

Brake switch

The brake switch consists of a rectifier and an electronic circuit breaker for the switching of an electromechanical brake. The brake switch is mounted on the control cabinet plate by means of two screws. Control is carried out via a digital output of the inverter.

Brake switch

Type	Features	Product key
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 ▶ Enclosure: 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	E82ZWBRB

→ Data sheet on E82ZWBRE brake switch
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

USB diagnostic adapter

On the Inverter Drives 8400, operation, parameter setting and diagnostics via the L-force diagnostic interface are carried out using the X400 keypad or a PC. The use of a PC requires the USB diagnostic adapter. A connecting cable is supplied to make the connection to the USB port on the PC.
Connecting cables in three different lengths of 2.5 m, 5 m and 10 m can be purchased separately to connect the USB diagnostic adapter to the L-force diagnostic interface (DIAG) on the inverter. Connection during operation is possible.

The software drivers required for the operation of the adapter are installed automatically when the Lenze software (L-force Engineer) is installed.

- On the 8400 StateLine and 8400 HighLine, the integrated CANopen interface can be used in conjunction with a PC system bus adapter to provide an alternative method to operation, parameter setting and diagnostics with the PC and the L-force Engineer software.

USB diagnostic adapter incl. connecting cable to the PC

Type		Features	Slot	Product key
USB diagnostic adapter		▶ Input-side voltage supply via USB connection on PC ▶ Output-side voltage supply via diagnostic interface of the inverter ▶ Diagnostic LED ▶ Electrical isolation of PC and inverter ▶ Hot-pluggable ▶ Supported operating systems: Microsoft® Windows® 2000/XP	DIAG	E94AZCUS

Connecting cables for USB diagnostic adapter

Type	Features	Product key
Connecting cable for USB diagnostic adapter	▶ Length: 2.5 m	EWL0070
	▶ Length: 5 m	EWL0071
	▶ Length: 10 m	EWL0072

X400 keypad

The keypad can be used as an alternative to a PC for local operation, parameter setting or diagnostics. Data can be accessed quickly via structured menus and a plain text display.
The keypad plugs into the L-force diagnostics interface (DIAG) on the front of the inverter.

X400 keypad

Type		Features	Slot	Product key
X400 keypad		▶ Menu navigation ▶ Graphics display with background lightning for clear presentation of information ▶ 4 navigation keys, 2 context-sensitive keys ▶ Adjustable RUN/STOP function ▶ Hot-pluggable ▶ Useable for L-force Inverter Drives 8400 and Servo Drives 9400	DIAG	EZAEBK1001

▶ 8400 StateLine and 8400 HighLine products are available with a keypad attached. If you want to purchase the products in this complete format, please add the following to the inverter product key when placing your order: E84AV ... 0-**XXKXX**

Diagnosis terminal X400

Type		Features	Slot	Product key
Diagnosis terminal X400		▶ X400 keypad in a robust housing ▶ Also suitable for installation in the control cabinet door ▶ incl. 2.5 m cable ▶ IP20 enclosure, IP65 for control cabinet installation on front face ▶ Useable for L-force Inverter Drives 8400 and Servo Drives 9400	DIAG	EZAEBK2001

PC system bus adapter

On the 8400 BaseLine C, StateLine C and HighLine C, the integrated CANopen interface can be used in conjunction with a PC system bus adapter to provide an alternative method of operation, parameter setting and diagnostics with the PC and L-force Engineer software. This option requires a PC system bus adapter instead of a USB diagnostic adapter. This adapter is plugged into the parallel interface or the USB port on the PC. The corresponding drivers are installed automatically. Depending on the design, the voltage supply for the adapter is provided either via the DIN or PS2 connection or via the USB port on the PC.

EMF2173IBV003 adapter

Advantage:

- Operation, parameter setting and diagnostics in parallel to the keypad
- In networked systems, a number of inverters can be addressed in parallel from a single location (remote parameterisation)

Type	Features	Product key
PC system bus adapter	▶ Voltage supply via DIN port on PC	EMF2173IB
	▶ Voltage supply via PS2 connection on PC	EMF2173IBV002
	▶ Voltage supply via PS2 connection on PC ▶ Electrical isolation from the bus	EMF2173IBV003
	▶ Voltage supply via USB port on PC ▶ Electrical isolation from the bus	EMF2177IB

Shield connection

Type	Features	Product key
Shield connection	▶ Secure fastening of the motor cable shield to the inverter's shield connection ▶ Shipment quantity: 50 metal cable ties ▶ Cable diameter: 8...30 mm	EZAMBKBM

Setpoint potentiometer

The setpoint (e.g. speed) can be selected using an external potentiometer.
The setpoint potentiometer is connected to the inverter's input terminals. A scale and a rotary knob can also be supplied.

Setpoint potentiometer with scale and rotary knob

Type	Product key
Potentiometer 10 kOhm/1 W	ERPD0010K0001W
Rotary knob, 36 mm diameter	ERZ0001
Scale 0 ... 100%, 62 mm diameter	ERZ0002

Other accessories

Lenze also supplies additional accessories for all aspects of the Inverter Drives 8400. In the PC-based Automation catalogue, you can find

- remote maintenance components
- I/O systems
- and human-machine interfaces.

Prefabricated system cables for motor connection, fan connection and the connection of return lines can be found in the manual entitled "System Cables and Connectors" in the Lenze library on CD or online at http://www.lenze.de under "Technical Documentation"

PROFIBUS communication module

A communication module is used to connect the 8400 StateLine or HighLine to a bus system.

PROFIBUS communication module

Type		Features	Slot	Product key
Communication module				
PROFIBUS		▶ 5 LEDs for status display ▶ Address can be set by means of a DIP switch ▶ Electrically isolated from the bus ▶ Sub-D connection ▶ Suitable for 8400 StateLine and 8400 HighLine Inverter Drives	MCI	E84AYCPMV/S

▶ 8400 StateLine and 8400 HighLine products are available with a PROFIBUS communication module attached. If you want to purchase the products in this complete format, please add the following to the inverter product key when placing your order: E84AV ... 0-**PMXXX**

Standards and operating conditions

Product key			**E84AYCPMV/S**
Type Communication module			**PROFIBUS**
Enclosure EN 60529			IP20
Climatic conditions Storage (EN 60721-3-1) Transport (EN 60721-3-2) Operation (EN 60721-3-3)			1K3 (temperature: -25 °C ... +60 °C) 2K3 (temperature: -25 °C ... +70 °C) 3K3 (temperature: -10°C ... +55°C)
Insulation voltage to reference earth/PE EN 61800-5-1	U_{AC}	[V]	50.0

PROFIBUS communication module

Product key			E84AYCPMV/S
Communication Medium Communication profile Device profile			 RS 485 PROFIBUS-DP-V0 PROFIBUS-DP-V1 PROFIDrive, version 3
Baud rate		[kBit / s]	9.6 ... 12 000 (automatic detection)
Node			Slave
Network topology			with repeater: Line or tree without repeater: Line
Process data words (PCD) 16 Bit			1 ... 16
DP user data length			Optionaler Parameterkanal (4 Wörter) + Prozessdatenwörter
Number of bus nodes			31 slaves + 1 master per bus segment With repeaters: 125
Max. cable length per bus segment	I_{max}	[m]	1200 (depending on the baud rate and the cable type used)

EtherCAT communication module

A communication module is used to connect the 8400 StateLine or HighLine to a bus system.

EtherCAT communication module

Type		Features	Slot	Product key
Communication module				
EtherCAT		▶ Distributed clock ▶ 2 RJ45 connections with LEDs for link/activity ▶ 5 LEDs for status display ▶ Connection option for separate 24 V supply ▶ Suitable for 8400 StateLine and 8400 HighLine Inverter Drives	MCI	E84AYCETV/S

▶ 8400 StateLine and 8400 HighLine products are available with an EtherCAT communication module attached. If you want to purchase the products in this complete format, please add the following to the inverter product key when placing your order: E84AV ... 0-**ETXXX**

Standards and operating conditions

Product key			**E84AYCETV/S**
Type Communication module			**EtherCAT**
Enclosure EN 60529			IP20
Climatic conditions Storage (EN 60721-3-1) Transport (EN 60721-3-2) Operation (EN 60721-3-3)			 1K3 (temperature: -25 °C ... +60 °C) 2K3 (temperature: -25 °C ... +70 °C) 3K3 (temperature: -10°C ... +55°C)
Insulation voltage to reference earth/PE EN 61800-5-1	U_{AC}	[V]	50.0

EtherCAT communication module

Product key			E84AYCETV/S
Communication Medium Communication profile			CAT5e S/FTP according to ISO/ICE11801 (2002) CoE (CANopen over EtherCAT)
Baud rate		[MBit / s]	100
Node			Slave
Network topology			Line
Number of logical process data channels			1
Process data words (PCD) 16 Bit			1 ... 16
Number of bus nodes			max. 65535
Max. cable length between two nodes	l_{max}	[m]	100

PROFINET communication module

A communication module is used to connect the 8400 StateLine or HighLine to a bus system.

PROFINET communication module

Type		Features	Slot	Product key
Communication module				
PROFINET		▶ 2 RJ45 connections with LEDs for link/activity ▶ 5 LEDs for status display ▶ Connection option for separate 24 V supply ▶ Suitable for 8400 StateLine and 8400 HighLine Inverter Drives	MCI	E84AYCERV/S

▶ The 8400 StateLine and 8400 HighLine products are available with the PROFINET communication module attached. If you want to purchase the products in this complete format, please add the following to the inverter product key when placing your order: E84AV ... 0-**ERXXX**

Standards and operating conditions

Product key			**E84AYCERV/S**
Type Communication module			**PROFINET**
Enclosure EN 60529			IP20
Climatic conditions Storage (EN 60721-3-1) Transport (EN 60721-3-2) Operation (EN 60721-3-3)			 1K3 (temperature: -25 °C ... +60 °C) 2K3 (temperature: -25 °C ... +70 °C) 3K3 (temperature: -10°C ... +55°C)
Insulation voltage to reference earth/PE EN 61800-5-1	U_{AC}	[V]	50.0

PROFINET communication module

Product key			E84AYCERV/S
Communication Medium Communication profile			CAT5e S/FTP according to ISO/ICE11801 (2002) PROFINET RT Conf. Class B
Baud rate		[MBit / s]	100
Node			Slave (Device)
Network topology			Line
Number of logical process data channels			1
Process data words (PCD) 16 Bit			1 ... 16
Max. cable length between two nodes	l_{max}	[m]	100

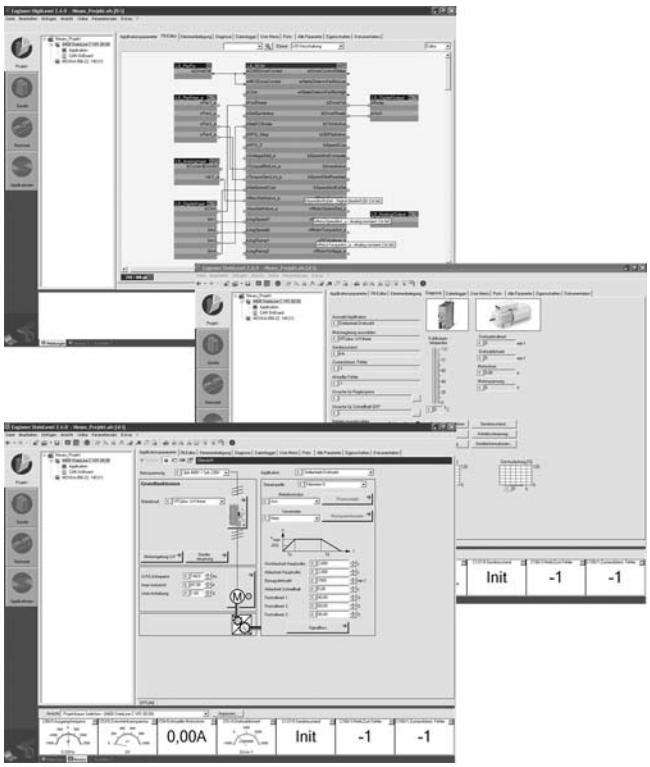
General information

The L-force Engineer is the engineering tool for commissioning and diagnosing Inverter Drives 8400. The user interface is intuitive and easy to use. The clearly structured dialogues of the L-force Engineer are specially adapted to the requirements of the users.
Various views are used as the primary means of navigation and these enable the key functions to be sorted and presented in a clear manner. In addition, numerous graphical interfaces simplify the configuration and parameter setting processes for the drives. As a result, in many cases more complicated programming can be replaced with simple configuration.

The L-force Engineer StateLevel/HighLevel readily supports multi-drive engineering. A large number of functions enable your machine to be optimally configured, set-up and diagnosed.

The following variants are available:

- **Engineer StateLevel (free download or CD)**
  Featuring all the necessary diagnostic functions, this product is ideal for service employees and commissioning personnel. It has been optimised for commissioning the Inverter Drives 8400 and the Servo Drives 9400, thus enabling you to create smaller projects with up to 5 target systems. In addition, the CD includes the "GDC easy" parameter setting program and L-force Loader to enable commissioning of additional target systems.
- **Engineer HighLevel**
  Engineer HighLevel is the full version and can be obtained as a single-user, multiple-user, company or buyout licence. In addition to the functions of Engineer StateLevel, functions for extensive projects are included: network set-up function, function for interconnected communication, the function block editor and much, much more. Even a machine documentation from the Engineer project can be adopted. Everything is therefore always available to you centrally just where you need it – without you having to spend a long time searching around.



User interfaces of L-force Engineer HighLevel

Functions and features

The following table describes functions and features of L-force Engineer:

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

Type	L-force Engineer StateLevel, freeware	L-force Engineer HighLevel
Drives and components	8400 Inverter Drives Servo Drives 9400 I/O system 1000, I/O system IP20 Lenze motors User motors	8400 Inverter Drives Servo Drives 9400 I/O system 1000, I/O system IP20 Lenze motors User motors
Project creation	Limitation to 5 target systems	Unlimited
Project documentation		Stored in project
Parameter setting	Graphics-based Parameter list	Graphics-based Parameter list
Networks and communication		CAN network configuration Communication interconnection Port editor (communication interface) Creation of machine application
Configuration		Function block editor
Diagnostics Status display	Terminal display/diagnostics overview Monitor window Logbook of all error messages Online values in graphics-based parameterisation Online/offline comparison Oscilloscope: 2-channel	Terminal display/diagnostics overview Monitor window Logbook of all error messages Online values in graphics-based parameterisation Online values in function block editor Network diagnostics Online/offline comparison Oscilloscope: 8-channel

Selection and order data

Benefits at a glance:

- Simple and transparent project view even of complex projects – independently of the network view
- High flexibility – functions can easily be post-installed
- Own project documentation can be integrated into the project – all the information is available at one place and can easily be found
- New graphics-based user interfaces for parameterising and configuring drives simplify work
- Simple graphics-based configuration of communication – no need to work with complicated parameters.

Type	Features	Product key
L-force Engineer StateLevel, freeware	▶ Order free of charge ▶ Download via the Internet ▶ Languages: German/English/French	Download free of charge
L-force Engineer HighLevel, single user licence	▶ CD-ROM included in scope of supply ▶ Installation on one PC ▶ Includes GDC, GD Loader and GD Oscilloscope ▶ Languages: German/English/French	ESPEVEHXAOEC1
L-force Engineer HighLevel, 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	ESPEGEHNNNML1 ESPEVEHNNNML1
L-force Engineer HighLevel, 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	ESPEGEHNNNFL1 ESPEVEHNNNFL1
L-force Engineer HighLevel, 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	ESPEGEHNNNBL1 ESPEVEHNNNBL1
Upgrade of GDC to L-force Engineer HighLevel	▶ Upgrade to Engineer HighLevel single user licence	ESPEVTDNNNEC1
	▶ Upgrade to Engineer HighLevel multiple user licence	ESPEVTDNNNMK1
	▶ Upgrade to Engineer HighLevel corporate licence	ESPEVTDNNNFK1
	▶ Upgrade to Engineer HighLevel buyout licence	ESPEVTDNNNBL1

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.

Communication	
CAN	USB connection via USB system bus adapter EMF2177IB Parallel interface with system bus adapter EMF2173IB
L-force diagnostic interface	USB connection with diagnostic adapter E94AZCUS

System requirements

System requirements for L-force Engineer State-Level/HighLevel
The following minimum hardware and software requirements must be met in order to be able to work with the L-force Engineer:

- Microsoft®Windows® 2000 SP2/XP or higher
- IBM-compatible PC with Intel® Pentium® processor 1.4 GHz (projects up to a maximum of 5 axes 750 MHz and higher)
- Min. 512 MB main memory (RAM), (projects up to a maximum of 5 axes min. 256 MB)
- Min. 950 MB free hard disk space
- Min. 1024 x 768 pixels screen resolution with 256 display colours
- Mouse
- CD-ROM drive
- Free slots/ports meeting the requirements of the individual fieldbus interface module

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