Decentralised drive solutions

Just like on our central 8400 control cabinet devices, the new decentralised drive solutions also save valuable time in all phases of the value-added chain - from installation, right up to service work. The new Inverter Drives 8400 motec and protec are also particularly innovative. Diverse options and accessories allow simple system integration and lead to cost-efficient drive solutions.

Consistently rightsized
You can choose exactly what you need for your individual application from a scaled product range, whether simple or complex.

The same product features – the same operation
Uniform product features simplify handling: once trained, designers, operators and service personnel can work confidently with all products on this platform. This saves valuable time – during project planning and commissioning, as well as during actual operation. You can perform the simplest of commissioning processes via DIP switches. Or why not make use of the engineering tool "L-force Engineer" for your most discerning tasks.

Plug&drive – Pluggable connection system
Unpack, plug in and you're ready to go. All the connections on the 8400 decentralised inverter (from the shielded motor cable and the mains supply right through to the fieldbus link and the connection of the sensors) consist of standardised screwed connections or connectors. The result: faster installation times.

Diagnostics at a glance
The excellent diagnostics options, which rely on status LEDs and easy-to-read displays, also play a role in increasing plant availability. For example, the 8400 motec features a large, two-coloured LED, which provides you with information about the inverter's status from a long way off.

Inverter Drives 8400 motec

Inverter Drives 8400 protec

8400 motec

The 8400 motec motor inverter is characterised by its user-friendly operation and installation.

The high level of efficiency that the 8400 motec demonstrates with regard to costs, space, time and energy is particularly apparent in the case of so-called "basic applications"

Cost benefits
- Really easy commissioning via DIP switches and potentiometer settings
- Reduced energy requirements thanks to energy-saving functions in conjunction with Lenze geared motors

Space benefits
- Integrated safety and fieldbus communication according to individual requirements
- Modular structure keeps the size of your spares inventory to a minimum

Time benefits
- Faster mounting and installation thanks to pluggable connection system: "unpack – plug in and get going!"
- The easy-to-replace memory module facilitates standard set-up and increases availability

Energy efficiency
- "VFC eco" mode enables the magnetising current to be adapted intelligently
- Energy savings of up to 30% can be achieved in the partial load operational range

Other benefits
- 200% overload current (3s)
- U/f control with and without encoder
- Sensorless vector control
- Short-circuit-proof and earth-fault protected
- DC-injection braking
- S-shaped ramp for smooth acceleration
- Max. output frequency 500 Hz
- 3 fixed frequencies
- CANopen, PROFIBUS, PROFINET, EtherCAT and AS interface
- STO safety function

Refreshingly straightforward
- The large LED, which you can see from a long way off, indicates the status during operation, with error causes signalled by means of various blinking patterns. This creates clarity during diagnostics and makes the whole process really easy

Mechanically and electrically robust
- Ideal for the most adverse of environments thank to the high IP65 degree of protection.

Major plus for decentralised applications
- All in all, the 8400 motec does everything expected of a modern and cost-effective motor inverter that is designed for universal use. Consequently, it is the perfect choice for decentralised tasks in the field of intralogistics, such as at airports or distribution centres.

Inverter Drives 8400 motec

8400 protec

A wall-mounted device with a high level of integration for complex decentralised systems. This device really stands out thanks to its sturdy construction, high level of operational reliability and rapid installation.

This highly functional inverter supports both straightforward and servo-like applications. The 8400 protec is supplied together with all necessary modules and interfaces, which means that it is ready to be connected straight away.

Local diagnostics

- There is a large display to keep you constantly informed of the device's operating status.
- Additional diagnostics information is signalled by the clearly arranged LEDs. These rapid diagnostic tools are an effective way of helping to increase plant availability.

Integrated decentralised positioning

- This device provides a cost-effective way of achieving decentralised positioning applications with asynchronous motors. Whether you are interested in switch-off, table or absolute positioning, the 8400 protec offers integrated solutions for all these applications. The functional range is rounded off with an option that allows you to connect both incremental and absolute value encoders.
- Parameters can be set conveniently using the "L-force Engineer“ software. The products in this range also feature a freely editable function block interconnection for integrating logic, arithmetic and mathematical programs based on graphical programming.

Safety engineering in accordance with EN ISO 13849-1

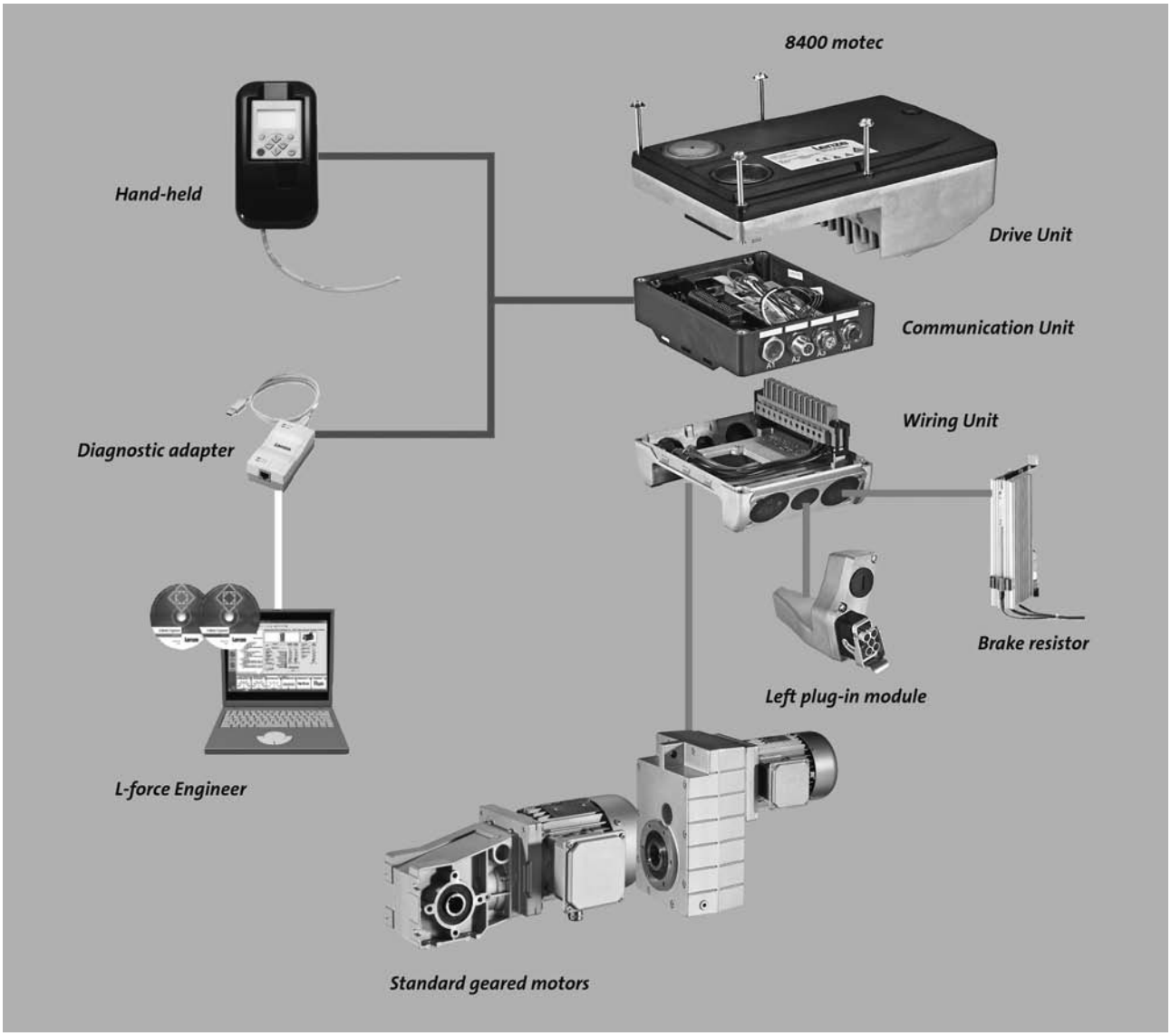
- The certified safety system enables not only the connection of local safety elements and safe communication via PROFIsafe but also a series of safety functions.
- Safe torque off (STO)
- Safe stop 1 (SS1)
- Safe stop emergency (SSE)
- Safe operation mode selector (OMS)
- Safe enable switch (ES)

Other benefits

- 200% overload current (3s)
- V/f control with and without encoder
- Sensorless vector control
- Servo control
- Resistant to short circuits and earth faults
- DC-injection braking
- S-ramp for smooth acceleration
- Max. output frequency 1000 Hz
- 15 fixed frequencies
- Standardised connectors
- CANopen, PROFIBUS, PROFINET

Inverter Drives 8400 protec

8400 motec system overview



8400 motec equipment

Status display LED

L-force diagnostic interface

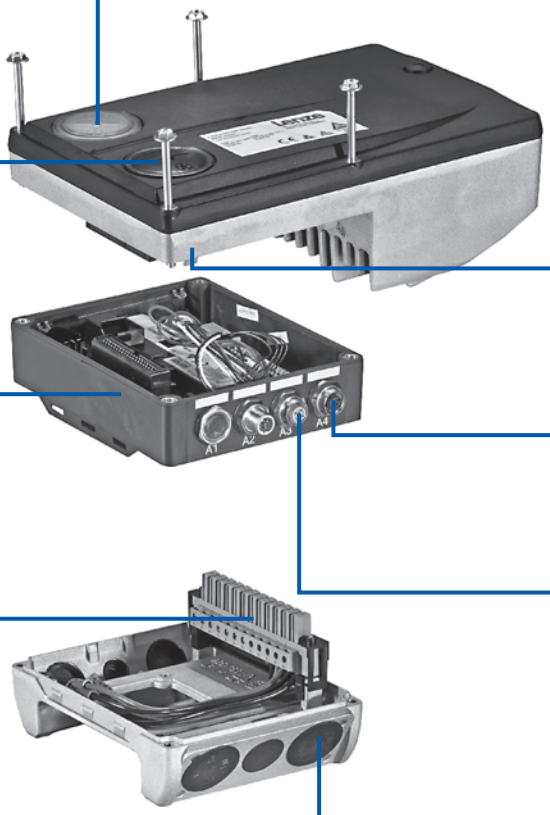
for USB adapter when PC or keypad is connected

Communication module

rotary so terminal side is variable

Plug connection

The three parts of the motec can be plugged into one another



DIP switch for quick setting

Safety system (STO)

Optional in the communication module

Plug connections

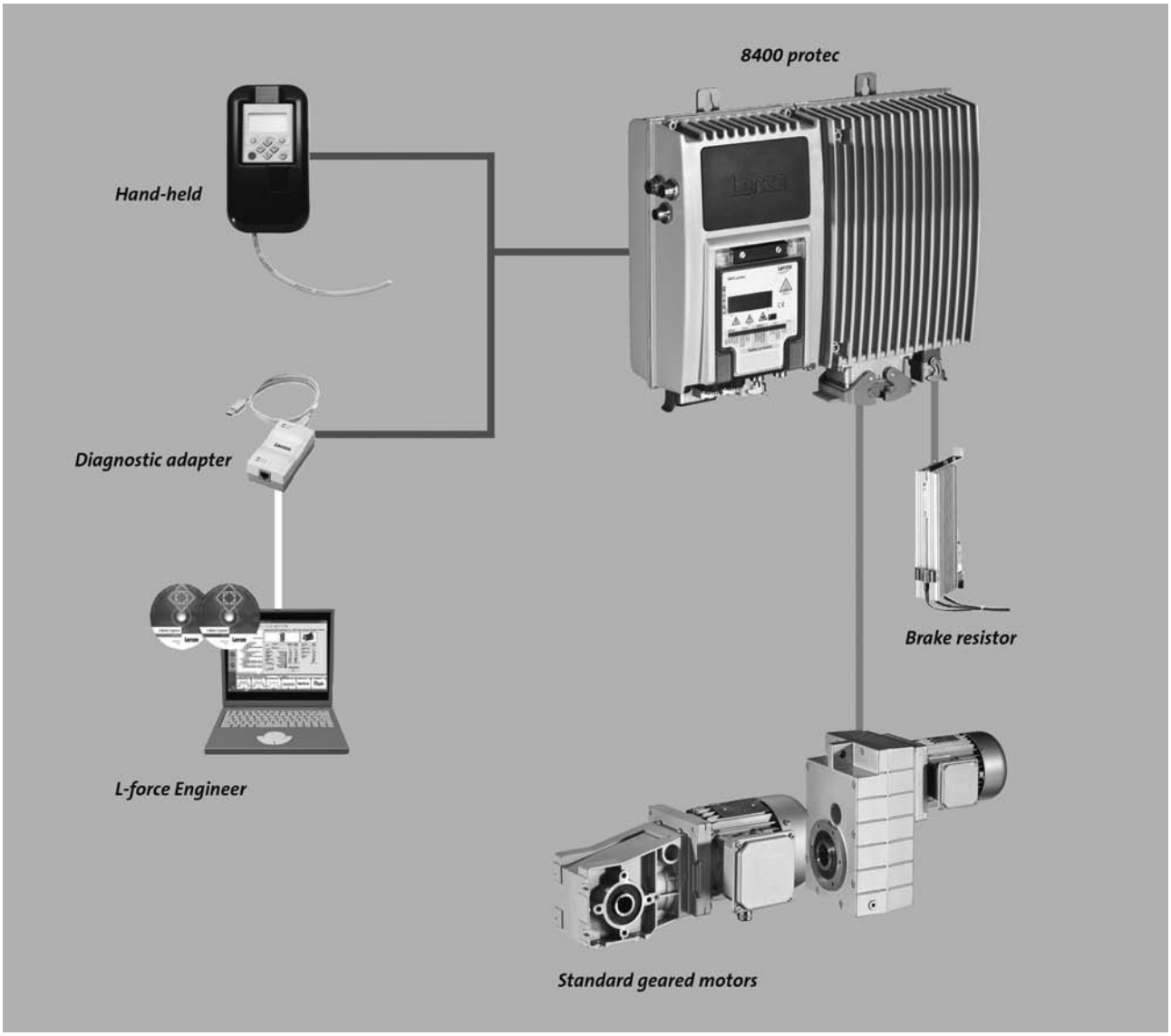
8 slots
A1 - A4 and B1 - B4

Power connections

Prepared for PG Screwed connection or plug-in module

9

8400 protec system overview



8400 protec equipment

Display and diagnostics

Status LEDs
L-force diagnostic interface

Safety system

optional

Brake resistor

Plug connection

Mains connection

Pluggable in loop-through technique

Motor connection

Connection via hybrid cable

Pluggable control connections

For commnication purposes and inputs/outputs

Functions and features

Mode Product	8400 motec	8400 protec
Control types, motor control	V/f control (linear or quadratic) V/f control with encoder Sensorless vector control (torque/speed)	V/f control (linear or quadratic) V/f control with encoder Sensorless vector control (torque/speed) Servo control (asynchronous motor)
Basic functions	Application-oriented commissioning (pre-defined application) Freely assignable user menu DC brake function Flying restart circuit S-shaped ramps for smooth acceleration Max. output frequency 300 Hz PID controller 3 fixed frequencies 200% overload current (3 s) "VFC eco" energy-saving function Parameter change-over (2x 16) Masking frequencies	Application-oriented commissioning (pre-defined application) Freely assignable user menu 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 (4x 32) Masking frequencies Logical functions, comparator, counter, 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 phase failure Mains phase failure Protection against restart for cyclic mains switching Motor overtemperature (input for PTC or thermal contact)	Short circuit Earth fault Overvoltage Motor stalling $I^2 \times t$ monitoring Motor phase failure Mains phase failure Protection against restart for cyclic mains switching Motor overtemperature (input for PTC or thermal contact)
Diagnostics		
Diagnostic interface	Integrated For USB diagnostic adapter with PC connection or keypad	Integrated For USB diagnostic adapter with PC connection or keypad
Status display	1 LEDs	18 LEDs
Braking operation		
Brake chopper	Integrated	Integrated
Brake resistor	Built-on module or external	Internal or external

Control connections

Mode Product	8400 motec	8400 protec
Analog inputs		
Number	1 Switchable: voltage or current input	1 Optional: voltage or current input
Resolution	10 bits	10 bits
Value range	0 ... 10 V, 0/4 ... 20 mA	0 ... 10 V, 0/4 ... 20 mA
Digital inputs		
Number	6 (5 + 1 controller enable)	6/0 or 4/2 (configurable)
Switching level	PLC (IEC 61131-2)	PLC (IEC 61131-2)
Max. input current	11 mA	11 mA
Digital outputs		
Number	1	0 or 2 (configurable)
Switching level	PLC (IEC 61131-2)	PLC (IEC 61131-2)
Max. output current	50 mA	200 mA per output
Relay		
Number	1	
Contact	NO contact	
AC connection	250 V, 3 A	
DC connection	24 V, 2 A ... 240 V, 0.16 A	
External 24 V DC supply	To support communication when the 400 V is switched off	To support communication when the 400 V is switched off
Internal 24 V DC supply	Max. 100 mA for inputs/outputs and sensor feeds	Max. 1 A for inputs/outputs and sensor feeds
Interfaces		
CANopen		on board optional
Extensions	Fieldbus via communication unit	Integrated fieldbus communication
Safety engineering	1 safe input for passive/active actuators	1-2 safe inputs for passive/active actuat-ors/PROFIsafe/PROFIsafe, depending on the safety option selected
Drive interface		
Encoder input	HTL, 2-track, 10 kHz Via 2 digital inputs,	HTL, 2-track, 10 kHz can also be used as a frequency input, 100 kHz, Via 2 digital inputs, SSI input (instead of analog input),

[1] For mains-independent control electronics supply

Standards and operating conditions

Mode Product			8400 motec
Conformity Type			CE: Low-Voltage Directive
Approval UL 508C			Power Conversion Equipment (File-No. E170350) [1]
Enclosure EN 60529 NEMA 250			IP65 Type 4 Type 12 [2]
Climatic conditions Storage (EN 60721-3-1) Transport (EN 60721-3-2) Operation (EN 60721-3-3) Current derating at over 45°C			1K3 (temperature: -30 °C ... +60 °C) 2K3 (temperature: -30 °C ... +75 °C) 3K3 (temperature: -30°C ... +55°C) 2.5% / K
Site altitude Amsl Current derating at over 1000 m	H_{max}	[m] [%/1000 m]	4000 5.00
Vibration resistance Transport (EN 60721-3-2) Operation (EN 60721-3-3) Operation (Germanischer Lloyd)			2M2 3M6 General conditions: acceleration resistant up to 2 g

Mode Product	8400 motec
Supply form	Systems with earthed star point (TN and TT systems) Systems with high-resistance or isolated star point (IT systems)
Noise emission EN 61800-3	Integrated radio interference suppression measures: conducted, category C1 Wall mounting: category C2 with a shielded motor cable of up to 20 m
Insulation resistance EN 61800-5-1	≤ 2000 m amsl overvoltage category III > 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

[1] In preparation: E84DVB□2224/3024S□1N2G
[2] Not with plug-in or braking resistor modules.

Standards and operating conditions

Mode Product			**8400 protec**
Conformity Type			CE: Low-Voltage Directive
Approval UL 508C [1)]			
Enclosure EN 60529 NEMA 250 [1)]			IP65 with control element "C" IP54
Climatic conditions Storage (EN 60721-3-1) Transport (EN 60721-3-2) Operation (EN 60721-3-3) Current derating at over 45°C			 1K3 (temperature: -25 °C ... +60 °C) 2K3 (temperature: -25 °C ... +75 °C) 3K3 (temperature: -25°C ... +55°C) 2.5% / K
Site altitude Amsl Current derating at over 1000 m	H_{max}	[m] [%/1000 m]	 4000 5.00
Vibration resistance Transport (EN 60721-3-2) Operation (EN 60721-3-3) Operation (Germanischer Lloyd)			 2M2 3M6

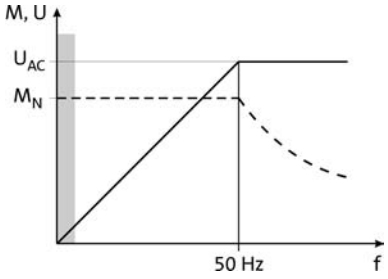
Mode Product	**8400 protec**
Supply form	Systems with earthed star point (TN and TT systems)
Noise emission EN 61800-3	Integrated RFI suppression: cable-guided, category C2 up to 20 m shielded motor cable
Insulation resistance EN 61800-5-1	≤ 2000 m amsl overvoltage category III > 2000 m amsl overvoltage 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

[1)] In preparation.

Whatever the application case, there is nearly always a frequency inverter to ensure that a system remains energy-efficient during operation. That is why there are various operating modes available that can be accessed by making a number of straightforward settings. In order to be able to identify the optimum operating mode at project planning stage, please refer to the following characteristics as well as to the associated technical data on subsequent pages.

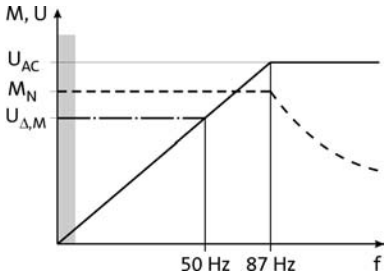
Standard setting

In its initial state when delivered, the frequency inverter is set up for simple operation on a three-phase AC motor with V/f control. In this mode, the rated torque of the motor is available in a setting range up to 50 Hz.



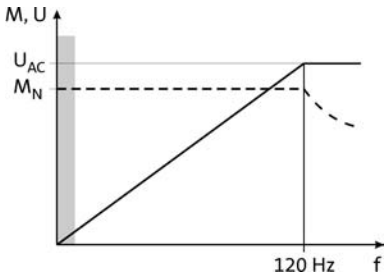
Extended setting range up to 87 Hz

If the V/f breakpoint is set to 87 Hz on the frequency inverter, the rated torque can be taken into account in an extended setting range. A 230/400 V motor might be connected in a delta layout with a 400 V frequency inverter here. The setting range is increased by 40 %. The frequency inverter must be dimensioned to handle the rated motor current of 230 V.



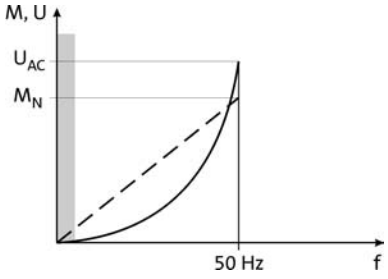
Operation with MF inverter-optimised motors

A large setting range and optimum operation with rated torque: these are the strengths of the MF motor on a frequency inverter. The motors are optimised for a setting range up to 120 Hz. When compared to 50 Hz operation, the setting range is 250 % greater. A drive simply cannot be operated more efficiently in a machine.



Operation with low loads

If a frequency inverter is used for a fan or a pump, the load is lower than in other applications. Here, the inverter can be operated in the "Increased rated power" mode. The required power is quadratic and a 1.2x overload capacity is sufficient. This characteristic can be set in the frequency inverter. As such, the inverter can be dimensioned one size smaller when set to this operating mode.



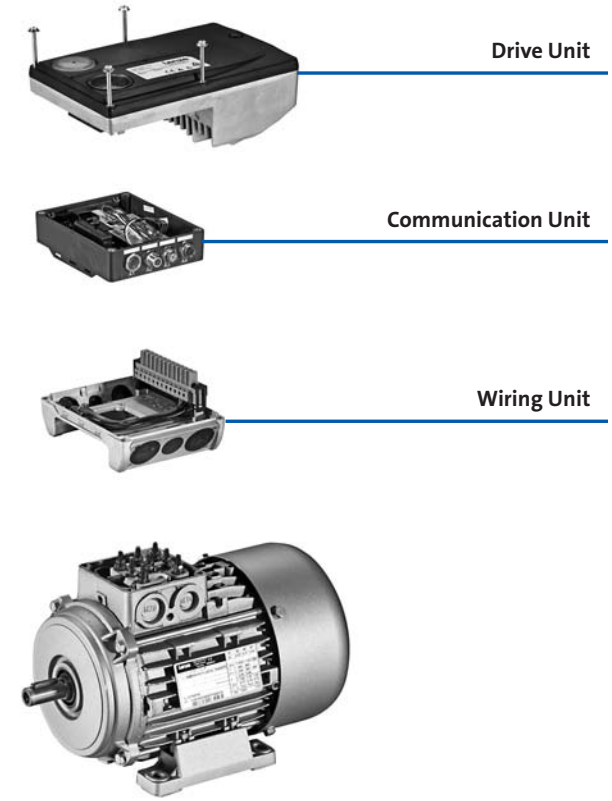
The three units

If you opt for the Drive Package, the 8400 motec motor inverter comes mounted on the geared motor. If you order the 8400 motec separately, all you need are four screws to mount it on the motor or the wall. To understand just how flexible the 8400 motec is, you need only consider its modular and well thought out structure, which consists of the "Drive Unit", "Communication Unit" and "Wiring Unit".
If the 8400 is ordered individually, you have a choice of various "units", which are supplied separately. The specific functions of the various units are as follows:

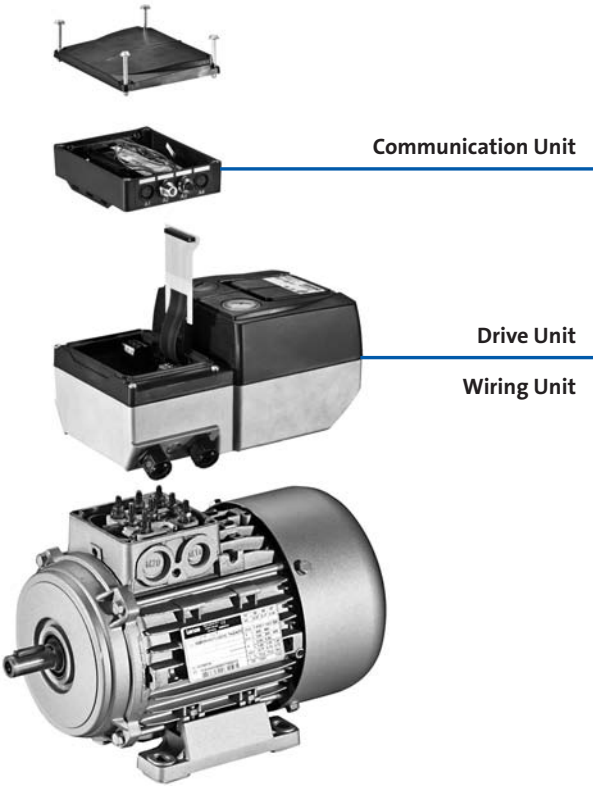
Drive Unit
- Inverter power unit
- Easy commissioning via DIP switches, potentiometer or diagnosis terminal
- An easy-to-replace memory module
- Large LED for the status display

Communication Unit
- Interface for I/Os and fieldbus links
- AS interface, CANopen, EtherCAT, PROFIBUS or PROFINET
- I/Os and on-board safety
- Pluggable M12 connection system

Wiring Unit
- Connections to the mains and to the drive
- Flexible connection options such as cable glands and diverse plug-in connectors
- Connection for brake resistor
- Connection for spring-applied brake



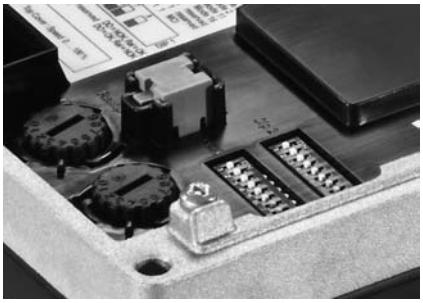
8400 motec 0.37 to 3.0 kW



8400 motec 4.0 to 7.5 kW

Drive Unit

Alongside the power section, the drive unit has several DIP switches and potentiometers on its underside. These make it easy to commission the inverter, allowing the configuration, speed and ramp to be set. This in turn allows the drive to be quickly and easily matched to the system.



Dip switches on Drive Unit

For the purpose of diagnostics, you can plug in a diagnostic adapter alongside the status display without having to disassemble the drive. Thanks to the potentiometer that can be accessed from above, you can make speed settings while the motor is actually running.

Drive Unit diagnostic terminal

Drive Unit diagnostic terminal

Communication unit

The communication modules support the following functions:
- Inverter control via digital and analog signals
- Inverter control via fieldbus systems
- Safe torque off functionality supported
- Connection options for sensors and actuators
- Sensors can be supplied with power using internal 24 V supply
- Connection possible via cable glands and M12 connectors. Up to a total of 8 screwed connections/connectors can be used. The individual Communication Units are equipped with the relevant connections according to the function they serve as standard.

Communication unit

Versions
- Basic I/O
- Standard I/O
- AS-i
- CANopen
- EtherCAT
- PROFIBUS
- PROFINET

Wiring Unit

The wiring unit forms the interface between the various motor sizes and inverters. It also secures flexibility in terms of options for connection of mains power, motor, brake and brake resistor.

The wiring unit also serves as a carrier for various additional modules such as:
- Wall mounting bracket
- Q5/0 plug-in module
  as a Q5/0 plug-in connection or loop-through connection
- Q4/2 plug-in module
  as a Q4/2 plug-in connection or loop-through connection
- Q8/0 plug-in module
  as a Q8/0 plug-in connection for the motor when wall mounted
- Brake cartridges
  for brake operation via the integrated brake chopper

Wiring Unit

8400 motec rated data

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

						
Typical motor power 4-pole asynchronous motor	**P**	[kW]	**0.37**	**0.55** [1)]	**0.55**	**0.75** [1)]
Product key Inverter Drive Unit			**E84DVB□3714S□□□2□** E84DGDVB37142PS		**E84DVB□5514S□□□2□** E84DGDVB55142PS	
Mains voltage range	U_{AC}	[V]	3/PE AC 320 V-0 % ... 528 V+0 %, 45 Hz-0 % ... 65 Hz+0 %			
Rated mains current	$I_{N, AC}$	[A]	1.30	1.60	1.80	2.20
Rated output current	$I_{N, out}$	[A]	1.30	1.60	1.80	2.20
Rated switching frequency	f_{ch}	[kHz]	8.00	4.00	8.00	4.00
Output current						
4 kHz	I_{out}	[A]	1.30	1.60	1.80	2.20
8 kHz	I_{out}	[A]	1.30		1.80	
16 kHz	I_{out}	[A]	0.90		1.20	

Rated data for 60 s overload

Max. output current	$I_{max, out}$	[A]	2.00	2.70
Overload time	t_{ol}	[s]	60.0	
Recovery time	t_{re}	[s]	120	

Rated data for 3 s overload

Max. short-time output current	$I_{max, out}$	[A]	2.60	3.60
Overload time	t_{ol}	[s]	3.00	
Recovery time	t_{re}	[s]	12.0	

[1)] Increased rated power operating mode at 40 °C ambient temperature and max. mains voltage of 400 V AC

8400 motec rated data

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

						
Typical motor power 4-pole asynchronous motor	**P**	[kW]	**0.37**	**0.55** [1]	**0.55**	**0.75** [1]
Product key Inverter Drive Unit			**E84DVB□3714S□□□2□** E84DGDVB37142PS		**E84DVB□5514S□□□2□** E84DGDVB55142PS	
Power loss	P_V	[kW]	26.0		33.0	
Mass	**m**	[kg]	2.60			
Max. cable length Shielded motor cable [2]	I_{max}	[m]	20.0			

Brake chopper rated data

Rated power, Brake chopper	P_N	[kW]	0.37	0.45	0.55	0.66
Max. output power, Brake chopper	$P_{max, 1}$	[kW]	0.55		0.83	
Min. brake resistance	R_{min}	[Ω]	180			

Dimensions

Dimensions			
Height	**h**	[mm]	109
Width	**b**	[mm]	161
Depth	**t**	[mm]	241.0

[1] Increased rated power operating mode at 40 °C ambient temperature and max. mains voltage of 400 V AC
[2] Technically possible cable lengths, irrespective of EMC requirements

8400 motec rated data

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

						
Typical motor power 4-pole asynchronous motor	**P**	[kW]	**0.75**	**1.10** [1]	**1.10**	**1.50** [1]
Product key Inverter Drive Unit			**E84DVB□7514S□□□2□** E84DGDVB75142PS		**E84DVB□1124S□□□2□** E84DGDVB11242PS	
Mains voltage range	U_{AC}	[V]	3/PE AC 320 V-0 % ... 528 V+0 %, 45 Hz-0 % ... 65 Hz+0 %			
Rated mains current	$I_{N, AC}$	[A]	2.40	2.90	3.20	3.80
Rated output current	$I_{N, out}$	[A]	2.40	2.90	3.20	3.80
Rated switching frequency	f_{ch}	[kHz]	8.00	4.00	8.00	4.00
Output current						
4 kHz	I_{out}	[A]	2.40	2.90	3.20	3.80
8 kHz	I_{out}	[A]	2.40		3.20	
16 kHz	I_{out}	[A]	1.60		2.10	

Rated data for 60 s overload

Max. output current	$I_{max, out}$	[A]	3.60	4.80
Overload time	t_{ol}	[s]	60.0	
Recovery time	t_{re}	[s]	120	

Rated data for 3 s overload

Max. short-time output current	$I_{max, out}$	[A]	4.80	6.40
Overload time	t_{ol}	[s]	3.00	
Recovery time	t_{re}	[s]	12.0	

[1] Increased rated power operating mode at 40 °C ambient temperature and max. mains voltage of 400 V AC

8400 motec rated data

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

						
Typical motor power 4-pole asynchronous motor	**P**	[kW]	**0.75**	**1.10** [1]	**1.10**	**1.50** [1]
Product key Inverter Drive Unit			**E84DVB□7514S□□□2□** E84DGDVB75142PS		**E84DVB□1124S□□□2□** E84DGDVB11242PS	
Power loss	P_V	[kW]	41.0		52.0	
Mass	**m**	[kg]	2.60			
Max. cable length Shielded motor cable [2]	I_{max}	[m]	20.0			

Brake chopper rated data

Rated power, Brake chopper	P_N	[kW]	0.75	0.90	1.10	1.32
Max. output power, Brake chopper	$P_{max, 1}$	[kW]	1.30		1.65	
Min. brake resistance	R_{min}	[Ω]	180			

Dimensions

Dimensions			
Height	**h**	[mm]	109
Width	**b**	[mm]	161
Depth	**t**	[mm]	241.0

[1] Increased rated power operating mode at 40 °C ambient temperature and max. mains voltage of 400 V AC
[2] Technically possible cable lengths, irrespective of EMC requirements

8400 motec rated data

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

						
Typical motor power 4-pole asynchronous motor	**P**	[kW]	**1.50**	**2.20** [1)]	**2.20**	**3.00** [1)]
Product key Inverter Drive Unit			**E84DVB□1524S□□□2□** E84DGDVB15242PS		**E84DVB□2224S□□□2□** E84DGDVB22242PS	
Mains voltage range	U_{AC}	[V]	3/PE AC 320 V-0 % ... 528 V+0 %, 45 Hz-0 % ... 65 Hz+0 %			
Rated mains current	$I_{N, AC}$	[A]	3.80	4.50	5.60	6.70
Rated output current	$I_{N, out}$	[A]	3.90	4.70	5.60	6.70
Rated switching frequency	f_{ch}	[kHz]	8.00	4.00	8.00	4.00
Output current						
4 kHz	I_{out}	[A]	3.90	4.70	5.60	6.70
8 kHz	I_{out}	[A]	3.90		5.60	
16 kHz	I_{out}	[A]	2.60		3.70	

Rated data for 60 s overload

Max. output current	$I_{max, out}$	[A]	5.90	8.40
Overload time	t_{ol}	[s]	60.0	
Recovery time	t_{re}	[s]	120	

Rated data for 3 s overload

Max. short-time output current	$I_{max, out}$	[A]	7.80	11.2
Overload time	t_{ol}	[s]	3.00	
Recovery time	t_{re}	[s]	12.0	

[1)] Increased rated power operating mode at 40 °C ambient temperature and max. mains voltage of 400 V AC

8400 motec rated data

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

						
Typical motor power 4-pole asynchronous motor	**P**	[kW]	**1.50**	**2.20** [1]	**2.20**	**3.00** [1]
Product key Inverter Drive Unit			**E84DVB□1524S□□□2□** E84DGDVB15242PS		**E84DVB□2224S□□□2□** E84DGDVB22242PS	
Power loss	P_V	[kW]	61.0		88.0	
Mass	**m**	[kg]	2.60		3.50	
Max. cable length Shielded motor cable [2]	I_{max}	[m]	20.0			

Brake chopper rated data

Rated power, Brake chopper	P_N	[kW]	1.50	1.80	2.20	2.64
Max. output power, Brake chopper	$P_{max, 1}$	[kW]	2.25		3.30	
Min. brake resistance	R_{min}	[Ω]	180		100	

Dimensions

Dimensions				
Height	**h**	[mm]	109	135
Width	**b**	[mm]	161	176
Depth	**t**	[mm]	241.0	261.0

[1] Increased rated power operating mode at 40 °C ambient temperature and max. mains voltage of 400 V AC
[2] Technically possible cable lengths, irrespective of EMC requirements

8400 motec rated data

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

						
Typical motor power 4-pole asynchronous motor	**P**	[kW]	**3.00**	**4.00** [1]	**4.00**	**5.50** [1]
Product key Inverter Drive Unit			**E84DVB□3024S□□□2□** E84DGDVB30242PS		**E84DVB□4024S□□□2□** -	
Mains voltage range	U_{AC}	[V]	3/PE AC 320 V-0 % ... 528 V+0 %, 45 Hz-0 % ... 65 Hz+0 %			
Rated mains current	$I_{N, AC}$	[A]	7.20	8.60	9.30	11.1
Rated output current	$I_{N, out}$	[A]	7.30	8.70	9.50	11.4
Rated switching frequency	f_{ch}	[kHz]	8.00	4.00	8.00	4.00
Output current 4 kHz 8 kHz 16 kHz	 I_{out} I_{out} I_{out}	 [A] [A] [A]	 7.30 7.30 4.90	 8.70 	 9.50 9.50 6.30	 11.4

Rated data for 60 s overload

Max. output current	$I_{max, out}$	[A]	11.0	14.3
Overload time	t_{ol}	[s]	60.0	
Recovery time	t_{re}	[s]	120	

Rated data for 3 s overload

Max. short-time output current	$I_{max, out}$	[A]	14.6	19.0
Overload time	t_{ol}	[s]	3.00	
Recovery time	t_{re}	[s]	12.0	

[1] Increased rated power operating mode at 40 °C ambient temperature and max. mains voltage of 400 V AC

8400 motec rated data

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

						
Typical motor power 4-pole asynchronous motor	**P**	[kW]	**3.00**	**4.00** [1]	**4.00**	**5.50** [1]
Product key Inverter Drive Unit			**E84DVB□3024S□□□2□** E84DGDVB30242PS		**E84DVB□4024S□□□2□** -	
Power loss	P_V	[kW]	111		140	
Mass	**m**	[kg]	3.50		5.30	
Max. cable length Shielded motor cable [2]	I_{max}	[m]	20.0			

Brake chopper rated data

Rated power, Brake chopper	P_N	[kW]	3.00		4.00	
Max. output power, Brake chopper	$P_{max, 1}$	[kW]	4.50		5.50	
Min. brake resistance	R_{min}	[Ω]	100		47.0	

Dimensions

Dimensions						
Height	**h**	[mm]	135		176	
Width	**b**	[mm]	176		195	
Depth	**t**	[mm]	261.0		325.0	

[1] Increased rated power operating mode at 40 °C ambient temperature and max. mains voltage of 400 V AC
[2] Technically possible cable lengths, irrespective of EMC requirements

8400 motec rated data

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

						
Typical motor power 4-pole asynchronous motor	**P**	[kW]	**5.50**	**7.50** [1]	**7.50**	**9.20** [1]
Product key Inverter			**E84DVB□5524S□□□2□**		**E84DVB□7524S□□□2□**	
Drive Unit			-			
Mains voltage range	U_{AC}	[V]	3/PE AC 320 V-0 % ... 528 V+0 %, 45 Hz-0 % ... 65 Hz+0 %			
Rated mains current	$I_{N, AC}$	[A]	12.8	15.3	16.3	19.5
Rated output current	$I_{N, out}$	[A]	13.0	15.6	16.5	19.8
Rated switching frequency	f_{ch}	[kHz]	8.00	4.00	8.00	4.00
Output current						
4 kHz	I_{out}	[A]	13.0	15.6	16.5	19.8
8 kHz	I_{out}	[A]	13.0		16.5	
16 kHz	I_{out}	[A]	8.60		10.9	

Rated data for 60 s overload

Max. output current	$I_{max, out}$	[A]	19.5	24.7
Overload time	t_{ol}	[s]	60.0	
Recovery time	t_{re}	[s]	120	

Rated data for 3 s overload

Max. short-time output current	$I_{max, out}$	[A]	26.0	33.0
Overload time	t_{ol}	[s]	3.00	
Recovery time	t_{re}	[s]	12.0	

[1] Increased rated power operating mode at 40 °C ambient temperature and max. mains voltage of 400 V AC

8400 motec rated data

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

						
Typical motor power 4-pole asynchronous motor	**P**	[kW]	**5.50**	**7.50** [1]	**7.50**	**9.20** [1]
Product key Inverter			**E84DVB□5524S□□□2□**		**E84DVB□7524S□□□2□**	
Drive Unit			-			
Power loss	P_V	[kW]	185		230	
Mass	**m**	[kg]	5.30			
Max. cable length Shielded motor cable [2]	I_{max}	[m]	20.0			

Brake chopper rated data

Rated power, Brake chopper	P_N	[kW]	5.50	6.60	7.50	9.20
Max. output power, Brake chopper	$P_{max, 1}$	[kW]	7.50		9.20	
Min. brake resistance	R_{min}	[Ω]	47.0			

Dimensions

Dimensions			
Height	**h**	[mm]	176
Width	**b**	[mm]	195
Depth	**t**	[mm]	325.0

[1] Increased rated power operating mode at 40 °C ambient temperature and max. mains voltage of 400 V AC
[2] Technically possible cable lengths, irrespective of EMC requirements

Communication modules

Various communication modules can be installed in the communication unit. They serve to connect the L-force Inverter Drives 8400 motec to a bus system.

Overview

	Controller enable	Digital inputs	Digital outputs	Relay outputs	Analog inputs	Safety STO	External 24 V DC supply
Communication module	Number	Number	Number	Number	Number	Number	Number
Basic I/O	1	2		1			
Standard I/O	1	5	1	1	1		
AS interface	1	5	1				
AS Interface STO	1	5	1	1	1	1	
CANopen	1	5	1				
CANopen STO	1	5	1	1	1	1	
EtherCAT	1	5	1				1
EtherCAT STO	1	5	1	1	1	1	1
PROFIBUS	1	5	1				1
PROFIBUS STO	1	5	1	1	1	1	1
PROFINET	1	5	1				1
PROFINET STO	1	5	1	1	1	1	1

► STO: Safe Torque Off

Safety engineering

The "safe torque off (STO)" safety function can be integrated into the Communication Unit in addition to the communication module. This combination is available with any bus.

Communication module	AS Interface STO	CANopen STO	EtherCAT STO	PROFIBUS STO	PROFINET STO
Certification					
EN ISO 13849-1			Category 4 PLe		
EN 61800-5-2			SIL 3		
EN 62061			SIL 3		
IEC 61508			SIL 3		
Fail-safe state			Safe torque off		

Communication modules without fieldbus link

The following modules are available for controlling the 8400 motec via digital signals:

- Basic I/O
- Standard I/O

The Basic I/O function module provides the inverter with a minimum number of digital inputs and outputs for the simplest applications.

The I/O function module Standard I/O provides the inverter with an extended number of digital inputs and outputs and is ideally suited to standard applications.

Basic I/O or Standard I/O

		
Product key	**E84DGFCN□NP**	**E84DGFCS□NP**
Mode Communication module	**Basic I/O**	**Standard I/O**
Features	2 digital inputs Controller enable 1 relay	Controller enable 5 digital inputs 1 digital output 1 analog input 1 relay
Number of free slots	8	8

Standards and operating conditions

Product key			**E84DGFCN□NP**	**E84DGFCS□NP**
Mode Communication module			**Basic I/O**	**Standard I/O**
Enclosure EN 60529			IP65	
Climatic conditions Storage (EN 60721-3-1) Operation (EN 60721-3-3) Transport (EN 60721-3-2)			1K3 (temperature: -30 °C ... +60 °C) 3K3 (temperature: -30°C ... +55°C) 2K3 (temperature: -30 °C ... +75 °C)	
Insulation voltage to reference earth/PE EN 61800-5-1	U_{AC}	[V]	50.0	

Pin assignment

In the case of the communication modules without fieldbus connection, only the variant "I/O terminal" is provided. It is connected by means of the cable gland.

AS interface (ASi) communication module

The AS interface communication module enables you to control the 8400 motec using digital control signals. The ASi bus system has become the established solution for transferring digital signals on the lowest field level. It is designed for applications that do not require the use of powerful fieldbus systems.

AS interface (ASi) communication module

The advantages of this system are:
- Easy handling and commissioning
- Less wiring effort
- Can be easily integrated into existing systems
- Cost reductions

		
Product key	**E84DGFCA□NP**	**E84DGFCA□JP**
Mode Communication module	**AS interface**	**AS Interface STO**
Features	Acyclical polling of diagnostic data Acyclical reading and writing of parameter sets Cyclical drive control Cyclical reading and writing of individual parameters Controller enable 5 digital inputs 1 digital output 4 digital inputs for when power is supplied via the ASi bus and there is no mains supply	Acyclical polling of diagnostic data Acyclical reading and writing of parameter sets Cyclical drive control Cyclical reading and writing of individual parameters Controller enable 5 digital inputs 1 digital output 4 digital inputs for when power is supplied via the ASi bus and there is no mains supply 1 analog input 1 relay Safety function STO
Number of free slots	6	6

Standards and operating conditions

Product key			**E84DGFCA□NP**	**E84DGFCA□JP**
Mode Communication module			**AS interface**	**AS Interface STO**
Enclosure EN 60529			IP65	
Climatic conditions Storage (EN 60721-3-1) Operation (EN 60721-3-3) Transport (EN 60721-3-2)			1K3 (temperature: -30 °C ... +60 °C) 3K3 (temperature: -30°C ... +55°C) 2K3 (temperature: -30 °C ... +75 °C)	
Insulation voltage to reference earth/PE EN 61800-5-1	U_{AC}	[V]	50.0	

AS interface (ASi) communication module

Technical data

Product key Communication module			E84DGFCA□NP	E84DGFCA□JP
Standard 240			EN 50295 / IEC 62026-2	
Communication Communication profile Medium			AS interface V3.0 2-wire cable for data and auxiliary power	
Network topology			Free topology (line, ring, tree, star)	
Node			max. 62 A/B slaves max. 31 standard slaves or safe slaves Slave (single or dual)	
Number of bus nodes			1 ... 31	
Max. cable length per bus segment	I_{max}	[m]	100 without repeaters / extenders 300 including 2 repeaters / extenders 500 only for star-shaped mains including repeaters / extenders	
Baud rate		[kBit / s]	167 (gross value) 53 (net with data transfer efficiency = 32%)	
Rated voltage DC	$U_{N, DC}$	[V]	24	

Pin assignment

Can be quickly connected to the bus and certain inputs/outputs via 5-pin M12 connector of the Communication Unit.

The connector is A-coded and can be connected using an ASi cable featuring penetration technology.

Mode	Variant	Product key	Slot							
Communication module			**A1**	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**
AS interface	**I/O terminal**	**E84DGFCAANP**	LED	ASi						
	I/O 2xM12	**E84DGFCA9NP**			DI1 DI2	DI3 DI4				
AS Interface STO	**I/O terminal**	**E84DGFCAAJP**								
	I/O 2xM12	**E84DGFCA9JP**			DI1 DI2	DI3 DI4				

- DI1 ... DI4= digital inputs
- LED= status display for bus communication

Communication module: CANopen

The CANopen communication module allows you to control the 8400 motec by sending digital control signals via the "CANopen“ bus system.

The advantages of this system are:
- Straightforward, yet extremely powerful, bus system
- Cost-effective
- Easy system integration, as there is a wide range of sensors and actuators available on the market

Communication module: CANopen

		
Product key	**E84DGFCC□NP**	**E84DGFCC□JP**
Mode Communication module	**CANopen**	**CANopen STO**
Features	Addressing via DIP switches or parameters Internal 24 V supply Controller enable 5 digital inputs 1 digital output	Addressing via DIP switches or parameters Internal 24 V supply Controller enable 5 digital inputs 1 digital output 1 analog input 1 relay Safety function STO
Number of free slots	6	6

Standards and operating conditions

Product key			**E84DGFCC□NP**	**E84DGFCC□JP**
Mode Communication module			**CANopen**	**CANopen STO**
Enclosure EN 60529			IP65	
Climatic conditions Storage (EN 60721-3-1) Operation (EN 60721-3-3) Transport (EN 60721-3-2)			1K3 (temperature: -30 °C ... +60 °C) 3K3 (temperature: -30°C ... +55°C) 2K3 (temperature: -30 °C ... +75 °C)	
Insulation voltage to reference earth/PE EN 61800-5-1	U_{AC}	[V]	50.0	

Communication module: CANopen

Technical data

Product key Communication module			E84DGFCC□NP	E84DGFCC□JP
Communication Medium Communication profile			DIN ISO 11898 CANopen, DS301 V4.02 Lenze system bus	
Baud rate		[kBit / s]	20 50 125 250 500 800 1000	
Node			Multi-master Slave	
Network topology			Line with terminating resistors (120 ohm) at both ends	
Number of logical process data channels			2 "send" PDOs and 2 "receive" PDOs (each with 1 - 8 bytes)	
Number of logic parameter data channels			Max. 2 server SDO channels (with 1 - 8 bytes)	
Number of bus nodes			63	
Max. cable length per bus segment	I_{max}	[m]	17 for 1000 kbps 40 for 800 kbps 110 for 500 kbps 290 for 250 kbps 630 for 125 kbps 1500 for 50 kbps 3900 for 20 kbps 8000 for 10 kbps	
Rated voltage DC	$U_{N, DC}$	[V]	24	

Pin assignment

Can be quickly connected to the bus and certain inputs/outputs via 5-pin M12 connector of the Communication Unit.

The connector is A-coded and can be connected using a 5-pole connection M12.

Mode	Variant	Product key	Slot							
Communication module			**A1**	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**
CANopen	**I/O terminal**	**E84DGFCCANP**		CAN-in	CAN-out					
	I/O 2xM12	**E84DGFCC9NP**	DI1 DI2			DI3 DI4				
CANopen STO	**I/O terminal**	**E84DGFCCAJP**								
	I/O 2xM12	**E84DGFCC9JP**	DI1 DI2			DI3 DI4				

► DI1 ... DI4= digital inputs

Communication module EtherCAT

When combined with the EtherCat communication module, the 8400 motec supports continuous communication from the field level right through to company management level.

The advantages of this system are:
- Fieldbus system capable of handling large data volumes
- Use of IT standards
- Integrated switch enables PROFINET to be looped directly through the inverters
- Integrated I/O node. Capable of communication and reading inputs even when the 400 V supply is switched off.
- Option of connecting an external 24 V supply

Communication module EtherCAT

		
Product key	**E84DGFCT□NP**	**E84DGFCT□JP**
Mode Communication module	**EtherCAT**	**EtherCAT STO**
Features	Support for the "Distributed clocks" (DC) functionality for synchronisation via fieldbus Link / Activity PDO transfer with CoE (CANopen over Ether-CAT) Cycle times: ► 1 ms or a full multiple of 1 ms ► Max. 15 ms when using "Distributed clocks" (DC) 4 LEDs for status display Controller enable 5 digital inputs 1 digital output	Support for the "Distributed clocks" (DC) functionality for synchronisation via fieldbus Link / Activity PDO transfer with CoE (CANopen over Ether-CAT) Cycle times: ► 1 ms or a full multiple of 1 ms ► Max. 15 ms when using "Distributed clocks" (DC) 4 LEDs for status display Controller enable 5 digital inputs 1 digital output 1 analog input 1 relay Safety function STO
Number of free slots	5	5

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Standards and operating conditions

Product key			**E84DGFCT□NP**	**E84DGFCT□JP**
Mode Communication module			**EtherCAT**	**EtherCAT STO**
Enclosure EN 60529			IP65	
Climatic conditions Storage (EN 60721-3-1) Operation (EN 60721-3-3) Transport (EN 60721-3-2)			1K3 (temperature: -30 °C ... +60 °C) 3K3 (temperature: -30°C ... +55°C) 2K3 (temperature: -30 °C ... +75 °C)	
Insulation voltage to reference earth/PE EN 61800-5-1	U_{AC}	[V]	50.0	

Communication module EtherCAT

Technical data

Product key Communication module			E84DGFCT□NP	E84DGFCT□JP
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 Switch	
Number of logical process data channels			1	
Process data words (PZD) to the master from the master			1 ... 10 (max. 20 bytes, 16 bits/word) 1 ... 8 (max. 16 bytes, 16 bits/word)	
Parameter data Max. mailbox size for CoE transfer		[Byte]	128	
Number of bus nodes			max. 65535	
Max. cable length between two nodes	I_{max}	[m]	100	
Rated voltage DC	$U_{N, DC}$	[V]	24	

Pin assignment

Can be quickly connected to the bus and certain inputs/outputs via 5-pin M12 connector of the Communication Unit.

The connector is A-coded and can be connected using a 5-pole connection M12.

Mode	Variant	Product key	Slot							
Communication module			**A1**	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**
EtherCAT	**I/O terminal**	**E84DGFCTANP**	LED	EC-in	EC-out					
	I/O 1xM12	**E84DGFCT9NP**				DI1 DI2				
EtherCAT STO	**I/O terminal**	**E84DGFCTAJP**								
	I/O 1xM12	**E84DGFCT9JP**				DI1 DI2				

- DI1 ... DI4= digital inputs
- LED= status display for bus communication

PROFIBUS communication modules

When combined with the PROFIBUS communication module, the 8400 motec supports PROFIBUS, the most widely used fieldbus system today.

The advantages of this system are:
- Widely used and extremely powerful fieldbus system
- Integrated I/O node. Capable of communication and reading inputs even when the 400 V supply is switched off.
- Option of connecting an external 24 V supply

PROFIBUS communication modules

		
Product key	**E84DGFCP□NP**	**E84DGFCP□JP**
Mode Communication module	**PROFIBUS**	**PROFIBUS STO**
Features	DPVO: basic functionalities such as cyclical data exchange and diagnostics DPV1: supports acyclical data exchange for parameter setting, operation and alarm handling Internal 24 V supply 4 LEDs for status display Controller enable 5 digital inputs 1 digital output	DPVO: basic functionalities such as cyclical data exchange and diagnostics DPV1: supports acyclical data exchange for parameter setting, operation and alarm handling Internal 24 V supply 4 LEDs for status display Controller enable 5 digital inputs 1 digital output 1 analog input 1 relay Safety function STO
Number of free slots	5	5

Standards and operating conditions

Product key			**E84DGFCP□NP**	**E84DGFCP□JP**
Mode Communication module			**PROFIBUS**	**PROFIBUS STO**
Enclosure EN 60529			IP65	
Climatic conditions Storage (EN 60721-3-1) Operation (EN 60721-3-3) Transport (EN 60721-3-2)			1K3 (temperature: -30 °C ... +60 °C) 3K3 (temperature: -30°C ... +55°C) 2K3 (temperature: -30 °C ... +75 °C)	
Insulation voltage to reference earth/PE EN 61800-5-1	U_{AC}	[V]	50.0	

PROFIBUS communication modules

Technical data

Product key Communication module			**E84DGFCP□NP**	**E84DGFCP□JP**
Communication Medium Communication profile			RS 485 PROFIBUS-DP-V0 (DRIVECOM) PROFIBUS-DP-V1 (PROFIdrive)	
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 (PZD) 16 Bit			1 ... 8	
DP user data length			Acyclic parameter data channel (DP-V1): max 240 bytes 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)	
Rated voltage DC	$U_{N, DC}$	[V]	24	

Pin assignment

Can be quickly connected to the bus and certain inputs/outputs via 5-pin M12 connector of the Communication Unit.

The connector is B-codiert coded and can be connected using a 5-pole connection M12.

Mode	Variant	Product key	Slot							
Communication module			**A1**	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**
PROFIBUS	**I/O terminal**	**E84DGFCPANP**	LED	PB-in	PB-out					
	I/O 1xM12	**E84DGFCP9NP**				DI1 DI2				
PROFIBUS STO	**I/O terminal**	**E84DGFCPAJP**								
	I/O 1xM12	**E84DGFCP9JP**				DI1 DI2				

- DI1 ... DI4= digital inputs
- LED= status display for bus communication

PROFINET communication modules

When combined with the PROFINET communication module, the 8400 motec supports a fieldbus system for continuous communication from the field level right through to the company management level.

The advantages of this system are:
- Fieldbus system capable of handling large data volumes
- Use of IT standards
- Integrated switch enables Profinet to be looped directly through the inverters
- Integrated I/O node. Capable of communication and reading inputs even when the 400 V supply is switched off.
- Option of connecting an external 24 V supply

PROFINET communication modules

		
Product key	**E84DGFCR□NP**	**E84DGFCR□JP**
Mode Communication module	**PROFINET**	**PROFINET STO**
Features	Automatic detection of the 100 Mbps baud rate Creation of a line topology through integrated 2-port switch Support for I&M0...4 functionality for identification of the standard device Link / Activity 4 LEDs for status display Controller enable 5 digital inputs 1 digital output	Automatic detection of the 100 Mbps baud rate Creation of a line topology through integrated 2-port switch Support for I&M0...4 functionality for identification of the standard device Link / Activity 4 LEDs for status display Controller enable 5 digital inputs 1 digital output 1 analog input 1 relay Safety function STO
Number of free slots	5	5

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Standards and operating conditions

Product key			**E84DGFCR□NP**	**E84DGFCR□JP**
Mode Communication module			**PROFINET**	**PROFINET STO**
Enclosure EN 60529			IP65	
Climatic conditions Storage (EN 60721-3-1) Operation (EN 60721-3-3) Transport (EN 60721-3-2)			1K3 (temperature: -30 °C ... +60 °C) 3K3 (temperature: -30°C ... +55°C) 2K3 (temperature: -30 °C ... +75 °C)	
Insulation voltage to reference earth/PE EN 61800-5-1	U_{AC}	[V]	50.0	

PROFINET communication modules

Technical data

Product key Communication module			**E84DGFCR□NP**	**E84DGFCR□JP**
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			Tree, star and line	
Number of logical process data channels			1	
Process data words (PZD) 16 Bit			1 ... 8	
Max. cable length between two nodes	I_{max}	[m]	100	
Rated voltage DC	$U_{N, DC}$	[V]	24	

Pin assignment

Can be quickly connected to the bus and certain inputs/outputs via 5-pin M12 connector of the Communication Unit.

The connector is B-codiert coded and can be connected using a 5-pole connection M12.

Mode	Variant	Product key	Slot							
Communication module			**A1**	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**
PROFINET	**I/O terminal**	**E84DGFCRANP**	LED	PN-in	PN-out					
	I/O 1xM12	**E84DGFCR9NP**				DI1 DI2				
PROFINET STO	**I/O terminal**	**E84DGFCRAJP**								
	I/O 1xM12	**E84DGFCR9JP**				DI1 DI2				

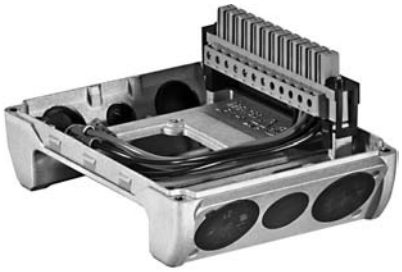
- DI1 ... DI4= digital inputs
- LED= status display for bus communication

Additional connections

All connections are generally connected internally to terminals. The most common connections of the Communication Unit already have plug connectors. If additional connections are to be implemented, these can be designed as standard PG glands.

Wiring Unit versions

The Wiring Unit forms the interface between the various sizes of motor frame and the inverter. It also provides flexibility in terms of power, motor, brake and brake resistor connections. The Wiring Unit is not dependent on the motor frame size or the terminal box size.

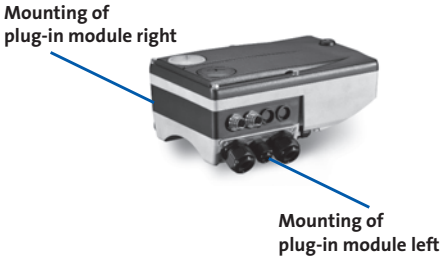


Wiring Unit

Product key	E84DGVN1E	E84DGVN2E	E84DGVN3E	E84DGVN4E	E84DGVN5E
Mode	**Wiring Unit**				
Features	Suitable for: E84DVB□3714 ... 1124 Suitable for: motor frame sizes 063 and 071 Enclosure IP66	Suitable for: E84DVB□5514 ... 1524 Suitable for: motor frame sizes 080, 090 and 100 Enclosure IP66	Suitable for: E84DVB□2224 ... 3024 Suitable for: motor frame sizes 080, 090, 100 and 112 Enclosure IP66	Suitable for: E84DVB□4024 ... 7524 Suitable for: motor frame sizes 080, 090, 100 and 112 Enclosure IP66	Suitable for: E84DVB□5524 ... 7524 Suitable for: motor frame sizes 132 Enclosure IP66

Connector modules

The 8400 motec inverter comes as standard with screwed connections for mains connection. Alternatively, Q4, Q5 or Q8 plug-in modules can be used. Thanks to the universal connection options of the modules, a supply bus can be established using plugs and a coupling without the need for any other external equipment.



HAN connector

Mode		Features	Product key
Plug-in module 1 x Q5/0, left		5 power contacts and PE: 16 A/400 V Applications with external mains distributor	E84DZEVBLANP
Plug-in module 1 x Q5/0, right			E84DZEVBRANP

HAN connector

Mode		Features	Product key
Plug-in module 2 x Q5, left		5 power contacts and PE: 16 A/400 V Applications with mains loops	E84DZEVBLAFP
Plug-in module 2 x Q5, right			E84DZEVBRAFP
Plug-in module 1 x Q4/2, left		4 power contacts and PE: 32 A/400 V 2 control contacts: 10 A/24 V Applications with external mains distributor	E84DZEVBLPNP
Plug-in module 1 x Q4/2, right			E84DZEVBRPNP
Plug-in module 2 x Q4/2, left		4 power contacts and PE: 32 A/400 V 2 control contacts: 10 A/24 V Applications with mains loops	E84DZEVBLPRP
Plug-in module 2 x Q4/2, right			E84DZEVBRPRP
Plug-in module 1 x Q8, left		6 power contacts and PE: 25 A/400 V Motor connection with wall mounting	E84DZEVBLCNP
Plug-in module 1 x Q8, right			E84DZEVBRCNP

Internal brake resistor

An internal brake resistor can also be mounted on the **right-hand** side of the 8400 motec instead of the plug-in modules.

Internal brake resistor

Typical motor power	Mains voltage	Product key		Rated resistance	Rated power	Thermal capacity
4-pole asynchronous motor		Inverter	Brake resistor			
P	U_{AC}			R_N	P_N	C_{th}
[kW]	[V]			[Ω]	[kW]	[KWs]
0.37	3 AC 320 ... 528	E84DVB□3714S□□□2□	E84DZEW220R	220	0.015	0.28
0.55		E84DVB□5514S□□□2□				
0.75		E84DVB□7514S□□□2□				
1.10		E84DVB□1124S□□□2□				
1.50		E84DVB□1524S□□□2□				
2.20		E84DVB□2224S□□□2□	E84DZEW100R	100		
3.00		E84DVB□3024S□□□2□				
4.00		E84DVB□4024S□□□2□	E84DZEW047R	47.0		
5.50		E84DVB□5524S□□□2□				
7.50		E84DVB□7524S□□□2□				

Wall mounting

The wall mounting feature enables the inverter to be attached to the chassis or to the wall. The design meets the requirements for IP65 degree of protection and ensures easy mounting.

Wall mounting

Product key	E84DZMAWE1
Mode	Wall mounting
Features	Enclosure IP65 Simple mounting

8400 protec rated data

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

				
Typical motor power 4-pole asynchronous motor	**P**	[kW]	**0.75**	**1.50**
Product key Inverter			**E84D□□□7514□□S□**	**E84D□□□1524□□S□**
Mains voltage range	U_{AC}	[V]	3/PE AC 320 V-0% ... 440 V+0%, 45 Hz-0 % ... 65 Hz+0%	
Rated mains current	$I_{N, AC}$	[A]	4.10	5.50
Rated output current	$I_{N, out}$	[A]	2.40	3.90
Rated switching frequency	f_{ch}	[kHz]	8.00	
Output current				
2 kHz	I_{out}	[A]	2.40	3.90
4 kHz	I_{out}	[A]	2.40	3.90
8 kHz	I_{out}	[A]	2.40	3.90
16 kHz	I_{out}	[A]	1.60	2.30

Rated data for 60 s overload

Max. output current	$I_{max, out}$	[A]	3.60	5.90
Overload time	t_{ol}	[s]	60.0	
Recovery time	t_{re}	[s]	120	

Rated data for 3 s overload

Max. short-time output current	$I_{max, out}$	[A]	4.80	7.80
Overload time	t_{ol}	[s]	3.00	
Recovery time	t_{re}	[s]	75.0	

8400 protec rated data

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

				
Typical motor power 4-pole asynchronous motor	**P**	[kW]	**0.75**	**1.50**
Product key Inverter			**E84D□□□7514□□S□**	**E84D□□□1524□□S□**
Power loss	P_V	[kW]	66.0 [2]	84.0 [2]
Mass	**m**	[kg]	7.62	
Max. cable length Shielded motor cable [1]	I_{max}	[m]	20.0	

Brake chopper rated data

Rated power, Brake chopper	P_N	[kW]	0.90	2.00
Max. output power, Brake chopper	$P_{max, 1}$	[kW]	3.50	
Min. brake resistance	R_{min}	[Ω]	150	

Dimensions

Dimensions			
Height	**h**	[mm]	260 [3]
Width	**b**	[mm]	353
Depth	**t**	[mm]	110.0

[1] Technically possible cable lengths, irrespective of EMC requirements
[2] Operation at rated output current $I_{N, out}$
[3] + 30 mm with connector shell.

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8400 protec rated data

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

				
Typical motor power 4-pole asynchronous motor	**P**	[kW]	**3.00**	**4.00**
Product key Inverter			**E84D□□□3024□□S□**	**E84D□□□4024□□S□**
Mains voltage range	U_{AC}	[V]	3/PE AC 320 V-0% ... 440 V+0%, 45 Hz-0 % ... 65 Hz+0%	
Rated mains current	$I_{N, AC}$	[A]	9.70	12.9
Rated output current	$I_{N, out}$	[A]	7.30	9.50
Rated switching frequency	f_{ch}	[kHz]	8.00	
Output current				
2 kHz	I_{out}	[A]	7.30	9.50
4 kHz	I_{out}	[A]	7.30	9.50
8 kHz	I_{out}	[A]	7.30	9.50
16 kHz	I_{out}	[A]	4.90	6.30

Rated data for 60 s overload

Max. output current	$I_{max, out}$	[A]	11.0	14.3
Overload time	t_{ol}	[s]	60.0	
Recovery time	t_{re}	[s]	120	

Rated data for 3 s overload

Max. short-time output current	$I_{max, out}$	[A]	14.6	19.0
Overload time	t_{ol}	[s]	3.00	
Recovery time	t_{re}	[s]	75.0	

8400 protec rated data

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

				
Typical motor power 4-pole asynchronous motor	**P**	[kW]	**3.00**	**4.00**
Product key Inverter			**E84D□□□3024□□S□**	**E84D□□□4024□□S□**
Power loss	P_V	[kW]	127 [2]	155 [2]
Mass	**m**	[kg]	11.3	
Max. cable length Shielded motor cable [1]	I_{max}	[m]	50.0	

Brake chopper rated data

Rated power, Brake chopper	P_N	[kW]	3.90	5.20
Max. output power, Brake chopper	$P_{max, 1}$	[kW]	11.2	
Min. brake resistance	R_{min}	[Ω]	47.0	

Dimensions

Dimensions			
Height	**h**	[mm]	260 [3]
Width	**b**	[mm]	434
Depth	**t**	[mm]	148.0

[1] Technically possible cable lengths, irrespective of EMC requirements
[2] Operation at rated output current $I_{N, out}$
[3] + 30 mm with connector shell.

Communication modules

The portec Inverter Drives 8400 are supplied with permanently installed communication modules. As well as containing the components for fieldbus communication, these modules also include the digital inputs and outputs. An analog input or a synchronous serial interface (SSI) can also be provided as an option.

Overview

	Digital inputs	Digital outputs	Analog inputs
Communication module	**Number**	**Number**	**Number**
CANopen	6 or 4 (configurable)	0 or 2 (configurable)	1 [1)]
PROFIBUS	6 or 4 (configurable)	0 or 2 (configurable)	1 [1)]
PROFINET	6 or 4 (configurable)	0 or 2 (configurable)	1 [1)]

[1)] Or as a synchronous serial interface (SSI).

Safety engineering

The following safety functions are integrated into the communication modules depending on the device version:

Safety option 10
- Safe torque off (STO)

- The drive is safely disconnected when a request is sent via connected active or passive sensors

Safety option 20
- Safe torque off (STO)
- Safety stop 1 (SS1)
- Safe stop emergency (SSE)
- Safe operation mode selector (OMS)
- Safe enable switch (ES)

- The drive is safely disconnected by a higher-level safety PLC by means of PROFIsafe/PROFINET

Safety option 30
- Safe torque off (STO)
- Safe stop 1 (SS1)
- Safe stop emergency (SSE)
- Safe operation mode selector (OMS)
- Safe enable switch (ES)

- The drive is safely disconnected by a higher-level safety PLC by means of PROFIsafe/PROFINET and via connected active or passive sensors

Safety functions	10	20	30
Certification			
EN ISO 13849-1	Category 4 / PLe	Category 3 / PLe	
EN 61800-5-2		SIL 3	
EN 62061		SIL 3	
IEC 61508		SIL 3	
Fail-safe state	Safe torque off		

Communication module: CANopen

The CANopen communication module allows you to control the 8400 protec by sending digital control signals via the "CANopen" bus system. With product key E84D□□□□□□□□C it is integrated into the inverter.

The advantages of this system are:
- Straightforward, yet extremely powerful, bus system
- Cost-effective
- Easy system integration, as there is a wide range of sensors and actuators available on the market.

Mode Communication module	**CANopen**
Features	Addressing via DIP switches or parameters

Technical data

Mode Communication module			**CANopen**
Communication Medium Communication profile Device profile			 DIN ISO 11898 CANopen, DS301 V4.02 Lenze system bus Lenze device control
Baud rate		[kBit / s]	20 50 125 250 500 800 1000
Node			Multi-master Slave
Network topology			Line with terminating resistors (120 ohm) at both ends
Number of logical process data channels			4 (each with 1 - 8 bytes)
Number of logic parameter data channels			5
Number of bus nodes			63
Max. cable length per bus segment	I_{max}	[m]	17 for 1000 kbps 40 for 800 kbps 110 for 500 kbps 290 for 250 kbps 630 for 125 kbps 1500 for 50 kbps 3900 for 20 kbps 8000 for 10 kbps

PROFIBUS communication modules

When combined with the PROFIBUS communication module, the 8400 protec supports the most widely used fieldbus system today.It is integrated in the inverter at the product key E84D□□□□□□□□P.

The benefits of this system include:

- Widely used and extremely powerful fieldbus system
- Integrated I/O node. Capable of communication and reading inputs even when the 400 V supply is switched off.

Mode Communication module	**PROFIBUS**
Features	DPVO: basic functionalities such as cyclical data exchange and diagnostics DPV1: supports acyclical data exchange for parameter setting, operation and alarm handling

Technical data

Mode Communication module			**PROFIBUS**
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 (PZD) 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)

PROFINET communication modules

When combined with the PROFINET communication module, the 8400 protec supports a fieldbus system for continuous communication from the field level right through to company management level.It is integrated in the inverter at product key E84D□□□□□□□□R.

The benefits of this system include:

- Fieldbus system capable of handling large data volumes
- Use of IT standards
- Integrated switch enables PROFINET to be looped directly through the inverters
- Integrated I/O node. Capable of communication and reading inputs even when the 400 V supply is switched off.

Mode Communication module	**PROFINET**
Features	Automatic detection of the 100 Mbps baud rate Creation of a line topology through integrated 2-port switch Support for I&M0...4 functionality for identification of the standard device Link / Activity

Technical data

Mode Communication module			**PROFINET**
Communication Medium Communication profile			CAT5e S/FTP according to ISO/ICE11801 (2002) PROFINET RT Conf. Class B
Baud rate		[MBit / s]	10/100
Node			Slave (Device)
Network topology			Tree, star and line
Number of logical process data channels			1 ring as client (media redundancy)
Process data words (PZD) 16 Bit			1 ... 16
Max. cable length between two nodes	l_{max}	[m]	100

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).

Brake resistor

8400 motec

Typical motor power	Mains voltage	Product key		Rated resist-ance	Rated power	Thermal capacity	Dimensions	Mass
4-pole asyn-chronous motor		Inverter	Brake resistor					
P	U_{AC}			R_N	P_N	C_{th}	h x b x t	m
[kW]	[V]			[Ω]	[kW]	[KWs]	[mm]	[kg]
0.37	3 AC 320 ... 528	E84DVB□3714S□□□2□	ERBS180R350W	180	0.35	53.0	382 x 124 x 122	2.00
0.55		E84DVB□5514S□□□2□						
0.75		E84DVB□7514S□□□2□						
1.10		E84DVB□1124S□□□2□						
1.50		E84DVB□1524S□□□2□						
2.20		E84DVB□2224S□□□2□	ERBS100R625W	100	0.63	94.0	566 x 124 x 122	3.00
3.00		E84DVB□3024S□□□2□						
4.00		E84DVB□4024S□□□2□	ERBS047R400W	47.0	0.40	60.0	400 x 110 x 105	2.30
5.50		E84DVB□5524S□□□2□	ERBS047R800W	47.0	0.80	120	710 x 110 x 105	3.90
7.50		E84DVB□7524S□□□2□						

8400 protec

Typical motor power	Mains voltage	Product key		Rated resist-ance	Rated power	Thermal capacity	Dimensions	Mass
4-pole asyn-chronous motor		Inverter	Brake resistor					
P	U_{AC}			R_N	P_N	C_{th}	h x b x t	m
[kW]	[V]			[Ω]	[kW]	[KWs]	[mm]	[kg]
0.75	3 AC 320 ... 440	E84D□□□7514□□S□	ERBS240R300W	240	0.30	45.0	382 x 124 x 122	2.00
1.50		E84D□□□1524□□S□	ERBS180R350W	180	0.35	53.0		
3.00		E84D□□□3024□□S□	ERBS047R400W	47.0	0.40	60.0	400 x 110 x 105	2.30
4.00		E84D□□□4024□□S□						

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 motec and 8400 protec, 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

Product key	**E94AZCUS**
Mode	**USB diagnostic adapter**
Features	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
Slot	DIAG

Connecting cables for USB diagnostic adapter

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

Diagnosis terminal

The diagnosis terminal can be used as an alternative to a PC if you are looking for an easy way to operate the inverter, set parameters or carry out diagnostics locally. The structured menus and plain text display provide quick access to data. The diagnosis terminal can be plugged into the inverter's L-force diagnostic interface (DIAG) from the outside.

Diagnosis terminal

Product key	**EZAEBK2003**
Mode	**Diagnosis terminal**
Features	Diagnosis terminal inside robust housing incl. 2.5 m cable Enclosure IP20 Suitable for L-force motec and protec Inverter Drives 8400 .
Slot	DIAG

Switch/potentiometer unit

The switch / potentiometer unit is directly mounted on the 8400 motec or somewhere else in the installation. With the switch/potentiometer unit and the control connections integrated in the inverter, the integrated potentiometer can be used to specify an analog setpoint. By means of the rotary switch, the drive can be started or stopped, for example, or the direction of rotation can be changed.
The switch/potentiometer unit is supplied with a 2.5 m connecting cable.

Switch/potentiometer unit

Product key	**E82ZBU**
Mode	**Switch/potentiometer unit (IP65)**

Memory module

All drive settings for the 8400 are stored on the memory module, which is a pluggable memory chip. You can copy the settings to other memory modules. The advantage for you: much faster commissioning, particularly in series production. Furthermore, the memory module ensures that drives can be replaced quickly and without errors being made.

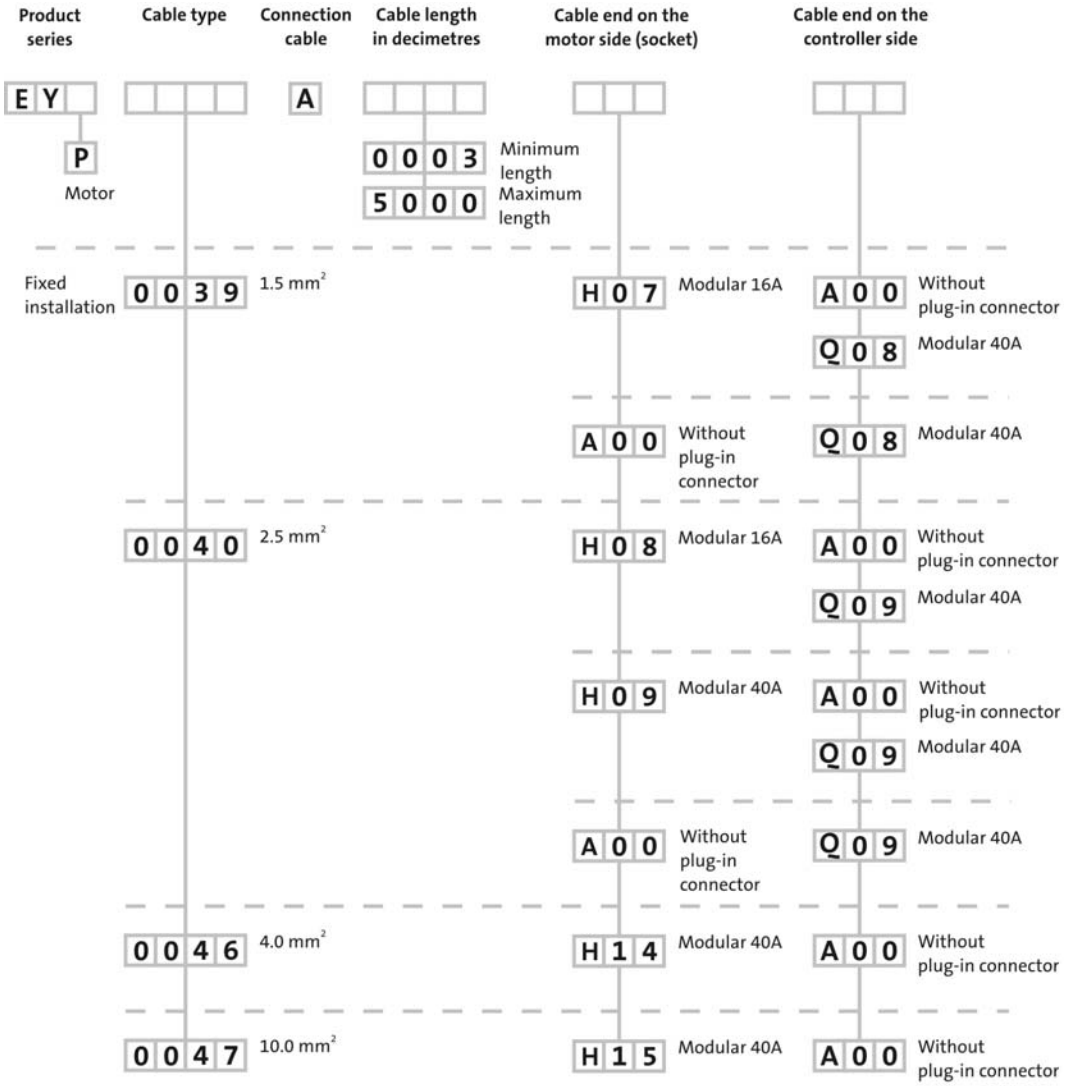
Product key	E84AYM20S/M	E84AYM10S/M
Mode	Memory module	Memory module
Features	For 8400 BaseLine, 8400 motec Packaging unit: 12 items	For 8400 StateLine, HighLine, Topline and 8400 protec Packaging unit: 5 items

Hybrid cable

For connection of the motor, Lenze provides finished hybrid cables. They are optimally matched to the connection between the Drive Package components. Motor connection, blower connection, brake connection and temperature monitoring are integrated in the cables. Cables up to a length of 100 m can be selected in increments of 0.1 m.

10-pole cables

Available with cross-sections 1.5^2 and 2.5^2 with connection for brake or thermal contact.



8-pole cables

Available with cross-sections 1.5^2 and 2.52 ^{2} with connection for brake and thermal contact.