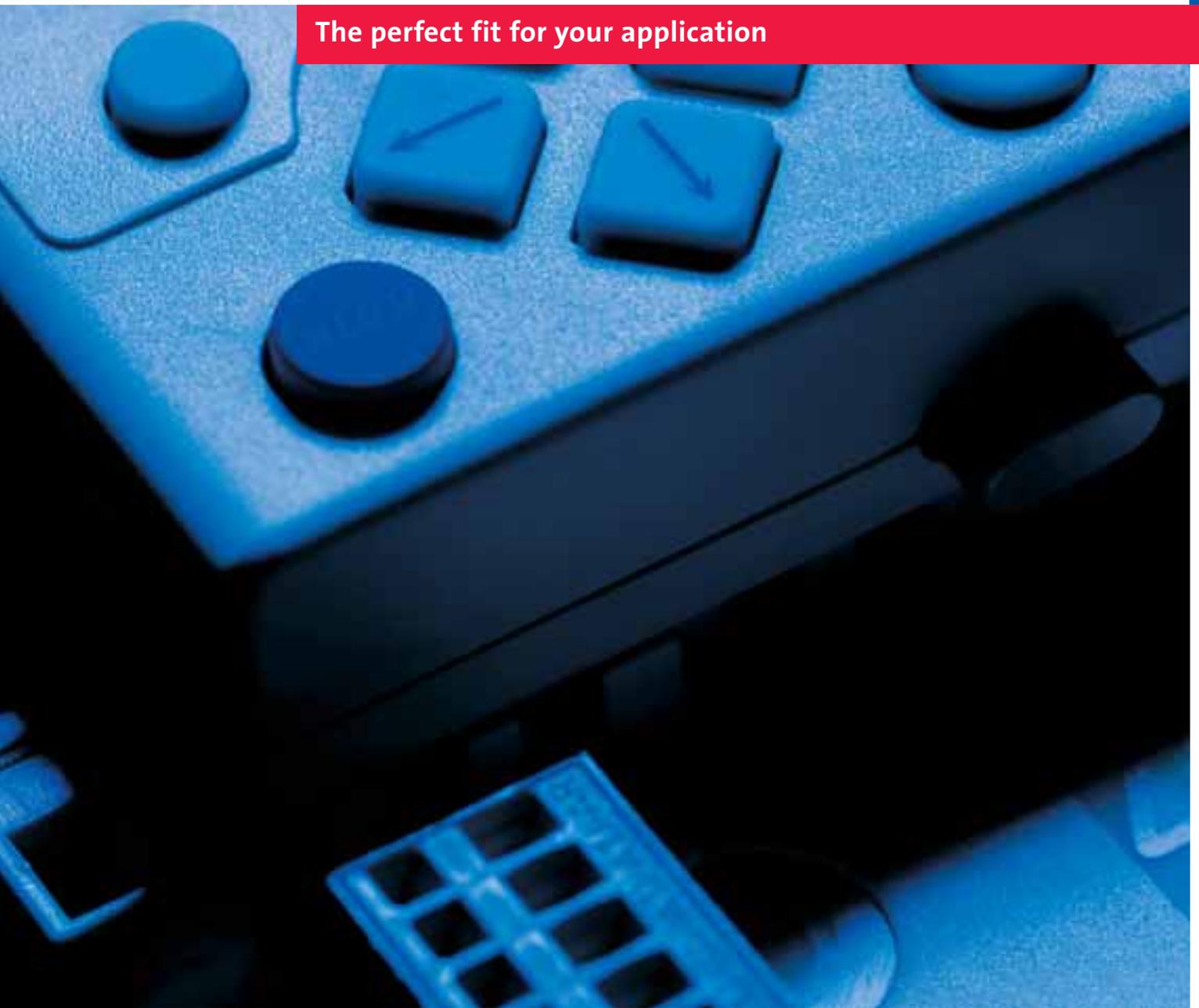


L-force

8400 Inverter Drives



The perfect fit for your application



Lenze

L-force | 8400 Inverter Drives

Cost-efficiency, time savings and quality enhancement are the challenges of the future. Lenze is meeting these challenges with L-force – the drives and automation family with a holistic solutions portfolio and harmonised interfaces and components, speeding up project planning and commissioning and increasing performance and flexibility in production.

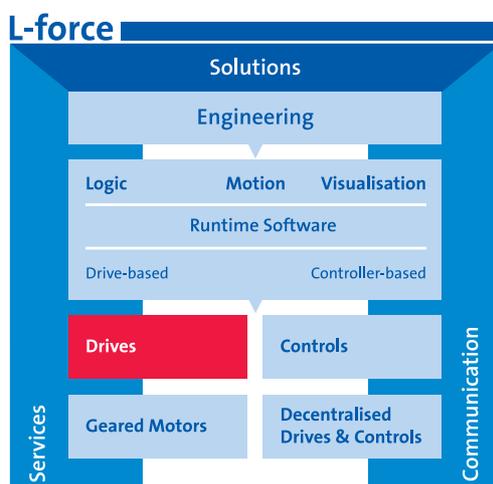
The Inverter Drives 8400 have been designed for consistent process optimisation – throughout all phases of the value-added chain. They reduce your expenditure from selection onwards, via project planning, production and commissioning and beyond to service. We call it rightsizing.

Rightsized for a diverse range of applications

Do you want to control or regulate three-phase AC motors, or achieve positioning with or without feedback? Then select the inverter that precisely meets your requirements from the Inverter Drives 8400 scaled range. What's more, the power range goes from 0.25 kW to 45 kW.

As the graded 8400 inverter series can provide just the right product for a wide range of applications, you are bound to be able to find an exact match.

Whilst the BaseLine is the ideal solution for straightforward applications, TopLine offers servo quality and is thus able to meet tougher challenges where dynamics and accuracy are concerned.



8400 BaseLine

8400 | The “rightsizing” principle

Rightsized for increased productivity

The designs in the 8400 series – BaseLine, StateLine, HighLine and TopLine – represent a consistent progression in terms of functions and drive behaviour, with each one building on the features of its predecessor. Making it easy for you to choose the right product for your application. At the same time, every design shares the same diagnostics connections and tools, operation and parameter settings. The strengths of the 8400 series really prove their superiority when you use different designs in your application.

Rightsized for the future

Making changes at a later date is not a problem either. If the features of a StateLine no longer suffice, for example, you can easily replace it with a HighLine – without having to redesign your control cabinet. Combined with environmentally-friendly production, compliant with ISO 14001 and RoHS – this makes the series future-proof.

Rightsized for quick start-up

The inverters are supplied complete with integrated shield connections. This reduces the time required to prepare

for and carry out assembly work. Simply select a predefined application and click once to tailor the inverter to meet the requirements of your application. In the simplest case scenario, you can simply start with the factory-set basic setting and do not have to touch even a single parameter.

Rightsized for optimised operation

The energy-saving function “VFC eco” supported by the 8400 reduces the energy required by the motor in partial load operation. Combine this with an MF L-force three-phase AC motor (inverter-optimised, 120 Hz) and what you get is a highly efficient, compact and cost-effective drive with high dynamic performance and a wide setting range. “VFC eco” can reduce your energy costs by up to 30%.

Rightsized for fast service

Diagnostics and parameter setting via remote maintenance make for quick and cost-effective service wherever you are in the world. Thanks to the memory module, integrated shield connections and pluggable terminals, drives can be replaced quickly, thereby reducing machine downtimes.



8400 StateLine



8400 HighLine



8400 TopLine

Technology | The equipment

Pluggable
mains connection

Pluggable connection
DC-bus connection
(400 V models)

Pluggable
relay connection*

Communication
module*
optional

Safety engineering
(STO)*
optional

Memory module
▶ Pluggable
▶ Contains all
drive data

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

Pluggable
control terminals
with spring
contacts

On-board CANopen
▶ DS301-compliant
▶ T-connector

Integrated
shield connection
for the motor cable

Integrated shield
connection
for control cables

Pluggable
motor connection



* 8400 StateLine, HighLine and TopLine

The memory module

All 8400 drive settings are stored on a pluggable memory chip (the memory module). You can copy the settings to other memory modules. How does this benefit you? Commissioning is much faster, particularly in series production. Furthermore, the memory module ensures that drives can be replaced quickly without errors.

Online diagnostics

Every design in the Inverter Drives 8400 series features a standard hot-pluggable interface for user-friendly operation, parameter setting and diagnostics. Even during operation – whether as a standalone device or networked via a fieldbus – access to data and parameter modification are assured.

Basic features of all 8400 models

- ▶ 150% overload current (60 s)
- ▶ 45°C operating temperature without current derating (max. 55°C)
- ▶ IP20 enclosure
- ▶ Memory module for fast commissioning and straightforward service
- ▶ L-force diagnostics interface for operation, parameter setting and diagnostics even during operation
- ▶ Integrated interference suppression to EN 61800-3
- ▶ Shield connection for control cables
- ▶ Automatic motor identification for optimum operational performance
- ▶ Function providing protection against short circuits, earth faults and motor stalling for safe operation



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.

In addition to the basic features, 8400 BaseLine also boasts:

- ▶ 180% overload current (3 s)
- ▶ Freely assignable “User” menu
- ▶ V/f control without feedback (linear or quadratic)
- ▶ Sensorless vector control
- ▶ Flying restart circuit
- ▶ S-ramps for smooth, virtually wear-free acceleration and deceleration
- ▶ DC brake function
- ▶ PID controller
- ▶ I²t motor monitoring
- ▶ optional CANopen on board (up to 1000 kbps)

StateLine | for controlled movement



The 8400 StateLine has been designed specifically for drive controls with or without speed feedback and is used wherever networking via bus systems is required. Furthermore, integrated brake handling contributes to a significant reduction in wear on service brakes. Even very frequent mains switching is unable to ruffle the feathers of the StateLine, as the input circuit is protected against overload.

The 8400 StateLine takes over applications whose complex requirements go beyond the capabilities of the BaseLine. It is also ideal for applications such as palletizers, extruders, filling systems or travelling/variable speed drives.

In addition to the features of the Baseline, the 8400 StateLine also boasts:

- ▶ 200% overload current (3 s)
- ▶ Slot for communication module
- ▶ CANopen on board (up to 1000 kbps)
- ▶ Mains-independent 24 V supply for control electronics and communication
- ▶ Shield connection for motor cable
- ▶ Also compatible for use in an IT system
- ▶ “VFC eco” energy-saving function
- ▶ Operation on synchronous motors without feedback
- ▶ V/f control with feedback
- ▶ Incremental encoder evaluation: HTL, 2-track, 10 kHz
- ▶ Brake management
- ▶ Parameter change-over
- ▶ Switch-off positioning without feedback
- ▶ Braking operation without brake resistor
- ▶ Logic functions, comparator, counter, arithmetic function
- ▶ Optional safety engineering (safe torque off, STO)

HighLine | for positioning tasks

An integrated point-to-point positioning system is just one of the functions supported by the 8400 HighLine in addition to those offered by the 8400 StateLine. Up to 15 selectable target positions, including the associated travel profile (e.g. acceleration), can be stored in the inverter. The higher-level control system selects these position sets and stipulates the sequence of events. The incremental encoder signal fed back is evaluated via two digital inputs, although in many applications feedback is not necessary.

The 8400 HighLine is recommended for applications such as rotary indexing tables, rolling and sliding doors, or positioning tasks in warehouse systems.

In addition to the features of the StateLine, the 8400 HighLine also boasts:

- ▶ Point-to-point positioning
- ▶ Incremental encoder evaluation: HTL, 2-track, 200 kHz
- ▶ Additional terminals for digital and analog input and output signals
- ▶ Frequency input (two-track, via digital inputs, 10 kHz)
- ▶ Digital output 2.5 A with integrated spark suppressor, e.g. for the direct control of a 24 V service brake



TopLine | for applications

8400 TopLine – the inverter offering servo quality within the 8400 series. Equipped with everything needed for a high dynamic response and precision in complex applications. Alongside a resolver input, there is also a multiple encoder input that can even be used at the same time and is a very useful addition to the spectrum of usable feedback systems. Cross-communication between multiple TopLine drives can be achieved cost-effectively by means of wiring (3-wire) via the separate axis bus provided. As well as asynchronous motors, the TopLine with feedback also supports more dynamic synchronous motors.

Benefit from precisely tailored, cost-optimised Lenze drives consisting of prepared system cables, motors and gearboxes, feedback units, brakes, fans and, of course, the 8400 TopLine.

The 8400 TopLine is recommended for storage and retrieval units, synchronised line drives or pick-and-place applications, to name just a few examples.

In addition to the features of the HighLine, the 8400 TopLine also boasts:

- ▶ Operation on synchronous motors with feedback
- ▶ Resolver input (Sub-D, 9-pin)
- ▶ Multiple encoder input (Sub-D, 15-pin) either for:
 - Incremental encoder, TTL, 2-track with zero track, 500 kHz
 - SinCos incremental encoder
 - SinCos absolute value encoder, single-turn/multi-turn (Hiperface®)
 - SSI absolute value encoder, single-turn/multi-turn
- ▶ KTY evaluation for motor temperature
- ▶ Electrical shaft (speed or angular synchronism) with configurable ratio



Communication | without limits

Communication modules

for fieldbus link for Stateline, HighLine and TopLine

- ▶ PROFIBUS (DP-V1)
- ▶ EtherCAT
- ▶ PROFINET
- ▶ Ethernet POWERLINK

More communication modules in preparation.



Remote maintenance

Access to Inverter Drives 8400 process data, parameters and application programs any time, anywhere

- ▶ Telephone network or Ethernet link
- ▶ Software integration could not be easier thanks to OPC technology



Accessories | to make life easy

Keypad

Fast access to parameters and operating data, e.g. for commissioning

- ▶ Supports hot plugging
- ▶ Graphics display (multilingual)
- ▶ Backlighting
- ▶ Easy user guidance
- ▶ For Stateline, HighLine and TopLine



Diagnosis terminal

Keypad in durable housing, also suitable for installation inside a control cabinet

- ▶ Supports hot plugging
- ▶ Graphics display (multilingual)
- ▶ Backlighting
- ▶ Easy user guidance
- ▶ Incl. 2.5 m cable
- ▶ IP20 enclosure; IP65 in for control cabinet installation
- ▶ For Stateline, HighLine and TopLine



Other accessories

are listed in the catalogues or at www.Lenze.com

Engineer and EASY Starter | Intuitive commissioning

L-force Engineer

The engineering tool for the configuration, parameter setting, commissioning and diagnostics of L-force products like the Inverter Drives 8400. Both the StateLevel and the HighLevel versions boast intuitive operation featuring transparent dialogs and graphical interfaces, making the L-force Engineer very easy to use. Multi-device engineering comes naturally with the L-force Engineer StateLevel and HighLevel.

StateLevel Engineer

Smaller projects involving up to five target systems can be implemented using this free version of the software.

HighLevel Engineer

Features additional functions for larger projects, e.g. "Build network", "Interconnect communication" or the function block editor. You can even integrate your own documentation into the Engineer project, so that everything is available centrally.

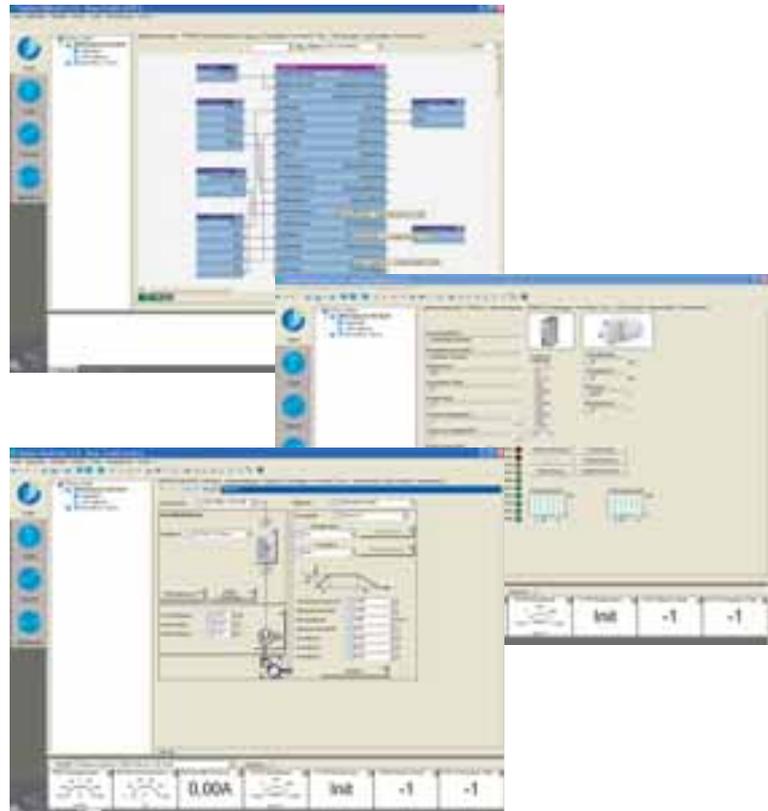
L-force EASY Starter

And if things are really very straightforward:
the free of charge software tool EASY Starter concentrates on the essentials for parameter setting, commissioning and diagnostics.

USB diagnostic adapter

for an isolated connection between your PC and the frequency inverter.

- ▶ Supports hot plugging
- ▶ Diagnostic LED for data transfer display
- ▶ Connecting cables available in lengths of 2.5, 5 or 10 m
- ▶ Plug and play



Technical data

		BaseLine D	BaseLine C	StateLine C	HighLine C	TopLine C
Performance data	Mains: 1 AC 230/240 V	0.25 ... 2.2 kW				0.55 ... 2.2 kW
	Mains: 3 AC 400/500 V	0.37 ... 3.0 kW		0.37 ... 45.0 kW		
	Overload current	150% (60 s) 180% (3 s)		150% (60 s) 200% (3 s)		
	Max. output frequency	300 Hz		1000 Hz		
Operating conditions	Operating temperature	-10 ... 55°C (derating above 45°C: 2.5%/K)				
	Transport	-25 ... 70°C				
	Storage	-25 ... 60°C				
	IP20 protection					

		BaseLine D	BaseLine C	StateLine C	HighLine C	TopLine C
Interfaces	Memory module	●	●	●	●	●
	L-force diagnostics interface	●	●	●	●	●
	Diagnostic LEDs	●	●	●	●	●
	CANopen on board (1000 kbps)	-	●	●	●	●
	DIP switch for CANopen (address, baud rate, bus termination)	-	-	●	●	●
	Slot for Communication module	-	-	●	●	●
	DC-bus connection (400 V models)	●	●	●	●	●
	Integrated brake chopper	400 V Models	400 V Models	●	●	●
	External 24 V supply	-	-	●	●	●
	PTC/thermal contact input	-	-	●	●	●
	"Controller enable" digital input	●	●	●	●	●
	Programmable digital inputs (DI _n)	4	4	4	7	7
	Encoder or frequency input (DI1, DI2)	-	-	10 kHz	200 kHz	200 kHz
	Additional frequency input (DI6, DI7)	-	-	-	10 kHz	10 kHz
	Relay output AC 250 V/3 A, DC 24 V/2 A ... 240 V/0,16 A	NO contact	NO contact	Changeover contact	Changeover contact	Changeover contact
	Digital outputs (50 mA)	1	1	1	3	3
	Digital output 2.5 A with integrated spark suppressor	-	-	-	●	●
	Analog inputs: 0 ... +/-10 V, 0/4 ... 20 mA	1 (unipolar)	1 (unipolar)	1	2	2
	Analog outputs: 0 ... 10 V, 0/4 ... 20 mA	-	-	1 (0 ... 10 V)	2	2
	Resolver input	-	-	-	-	●
	Multiple encoder input (TTL 500 kHz, SinCos, Hiperface®, SSI)	-	-	-	-	●
	Axis bus (for cross communication, synchronisation)	-	-	-	-	●

Technical data

		BaseLine D	BaseLine C	StateLine C	HighLine C	TopLine C
Functions	Application-oriented commissioning (predefined applications)	●	●	●	●	●
	Freely assignable "User" menu	●	●	●	●	●
	Motor identification	●	●	●	●	●
	V/f control without feedback (linear or quadratic)	●	●	●	●	●
	Sensorless vector control	●	●	●	●	●
	"VFC eco" energy-saving function	–	–	●	●	●
	Operation on synchronous motor without feedback	–	–	●	●	●
	V/f control with feedback	–	–	●	●	●
	Point-to-point positioning (with or without feedback)	–	–	–	●	●
	Operation on synchronous motors with feedback	–	–	–	–	●
	Flying restart circuit	●	●	●	●	●
	S-shaped ramps for smooth acceleration and deceleration	●	●	●	●	●
	I ² t motor monitoring	●	●	●	●	●
	Data logger	●	●	●	●	●
	DC brake function	●	●	●	●	●
	PID controller	●	●	●	●	●
	Fixed frequencies	3	3	15	15	15
	Parameter change-over	–	–	●	●	●
	Switch-off positioning (without feedback)	–	–	●	●	●
	Braking without brake resistor	–	–	●	●	●
	Brake management for Brake control with low rate of wear	–	–	●	●	●
	Inversion of motor phase sequence	–	–	●	●	●
	Skip frequencies	–	–	●	●	●
	Frequency inverter ixt monitoring	–	–	●	●	●
	Monitoring of I/O data during operation	–	–	●	●	●
	Logic functions, comparator, Counter, arithmetic function	–	–	●	●	●
	Function block interconnection for input and output signals	–	–	●	●	●
	Free function block interconnection	–	–	–	●	●
	Electrical shaft	–	–	–	–	●
	KTY evaluation for motor temperature	–	–	–	–	●
Properties	Protection against short circuit, earth fault, overvoltage, motor stalling	●	●	●	●	●
	Integrated interference suppression to EN 61800-3, Category C2	●	●	●	●	●
	Integrated shield connection for control cables	●	●	●	●	●
	Integrated shield connection for Motor cable	–	–	●	●	●
	Protection for cycl. mains switching (up to 22 kW)	–	–	●	●	●
	Usability in an IT system	–	–	●	●	●
	Fans can be replaced	–	–	●	●	●
	Interference suppression to EN 61800-3, Category C1 (footprint filter)	–	–	Option	Option	Option
	Safe torque off (STO), Certified to EN ISO 13849-1 (cat. 4, PL e), EN 61508/EN 62061 (SIL 3)	–	–	Option	Option	Option
	Approvals: CE, UL, GOST-R, RoHS	●	●	●	●	●

It's good to know | why we are there for you



"Our customers come first. Customer satisfaction is what motivates us. By thinking in terms of how we can add value for our customers we can increase productivity through reliability."



"We will provide you with exactly what you need – perfectly co-ordinated products and solutions with the right functions for your machines and installations. That is what we mean by 'quality'."



"Take advantage of our wealth of expertise. For more than 60 years now we have been gathering experience in various fields and implementing it consistently and rigorously in our products, motion functions and pre-configured solutions for industry."



"The world is our marketplace. Wherever you are in the world, we are nearby, providing you with our drive and automation solutions."

Algeria · Argentina · Australia · Austria · Belarus · Belgium · Bosnia-Herzegovina · Brazil · Bulgaria · Canada · Central America · Chile · China · Colombia · Croatia · Czech Republic · Denmark · Egypt · Estonia · Finland · France · Germany · Greece · Hungary · Iceland · India · Indonesia · Iran · Israel · Italy · Japan · Latvia · Lebanon · Lithuania · Luxembourg · Macedonia · Malaysia · Mauritius · Mexico · Montenegro · Morocco · Netherlands · New Zealand · Norway · Philippines · Poland · Portugal · Romania · Russia · Serbia · Singapore · Slovak Republic · Slovenia · South Africa · South Korea · Spain · Sweden · Switzerland · Syria · Taiwan · Thailand · Tunisia · Turkey · Ukraine · United Arab Emirates · United Kingdom/Eire · USA · Vietnam

You can rely on our service. Expert advice is available 24 hours a day, 365 days a year, in more than 30 countries via our international helpline: 008000 24 Hours (008000 2446877).

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