

Brushless DC-Servomotor

50 mNm

with integrated Motion Controller
and RS232 interface

For combination with (overview on page 14-15)
Gearheads:
30/1, 32/3, 38/1, 38/2

Series 3564 K 024 B CS

	3564 K		024 B CS	
Nominal voltage	U_N		24	Volt
Output power	$P_{2 \text{ max.}}$		90	W
Efficiency	$\eta_{\text{ max.}}$		80	%
No-load speed	n_o		10 500	rpm
No-load current	I_o		0,28	A
Peak torque for 8 A	M_P		160	mNm
Friction torque:				
– static	C_o		1,10	mNm
– dynamic	C_v		$2,4 \cdot 10^{-4}$	mNm/rpm
Torque constant	k_M		20,2	mNm/A
Current constant	k_i		0,05	A/mNm
Slope of n/M curve	$\Delta n / \Delta M$		31	rpm/mNm
Mechanical time constant	τ_m		11	ms
Rotor inertia	J		34	gcm^2
Angular acceleration	$\alpha_{\text{ max.}}$		109	10^3 rad/s^2
Thermal resistance	$R_{\text{th} 1} / R_{\text{th} 2}$	2,5 / 6,3		K/W
Thermal time constant	τ_{w1} / τ_{w2}	23 / 1 175		s
Operating temperature range		- 5 ... + 85		°C
Shaft bearings		ball bearings, preloaded		
Shaft load max.:				
– radial at 3000 rpm (7,4 mm from mounting flange)		108		N
– axial at 3000 rpm (push-on only)		50		N
– axial at standstill (push-on only)		131		N
Shaft play:				
– radial	\leq	0,015		mm
– axial	\parallel	0		mm
Housing material		aluminium, black anodized		
Weight		440		g
Direction of rotation		electronically reversible		

Recommended values - mathematically independent of each other

Speed range ¹⁾	n_e		5 - 12 000	rpm
Torque up to ²⁾	$M_{e \text{ max.}}$		50	mNm
Current up to ²⁾	$I_{e \text{ max.}}$		2,80 ³⁾	A

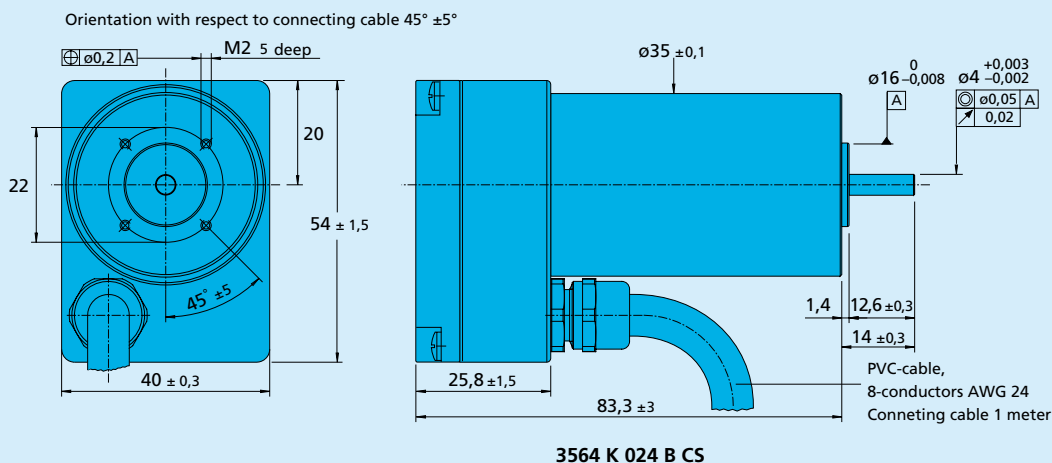
¹⁾ Power rating of 44 Watt at 8 400 rpm and 50 mNm

³⁾ This is a preset value and can be changed

²⁾ thermal resistance $R_{\text{th} 2}$ by 55% reduced

over the RS232 interface

scale reduced



Connection

Wires	Function
blue	GND
pink	+ 24 V
brown	Analog input
white	Fault output
grey	Analog GND
yellow	RS232 RXD
green	RS232 TXD
red	Connection No. 3

Caution:

be sure to connect motor supply terminals to the correct polarity. Motor electronics are protected against polarity reversal by an internal fuse. In case of damage due to polarity reversal, this internal fuse can only be replaced at the factory.

Motion Controller

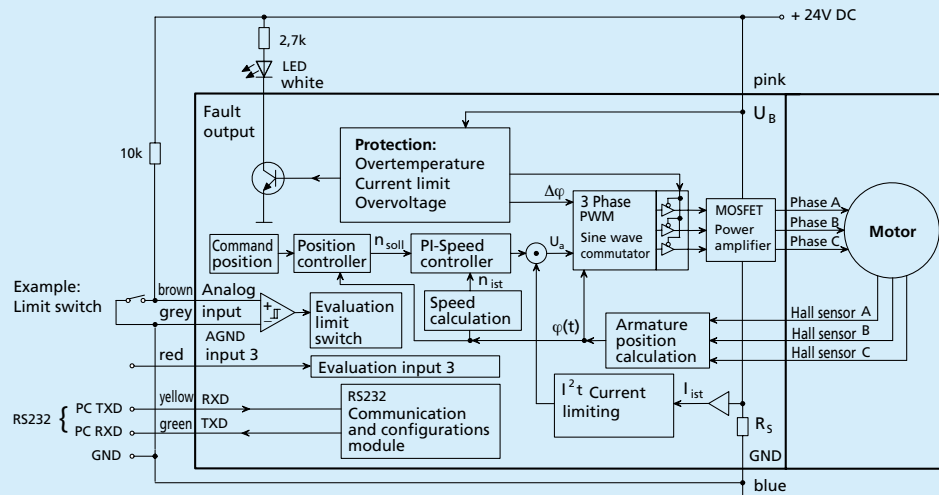
Supply voltage ¹⁾	U_B		12 ... 30	V DC
Peak current ²⁾	I_{max}		8	A
Input/output (see connection No. 1, 2 and 3)			3	
Connection No. 1 (brown)				
- Speed command analog input		voltage range	± 10	V
- Speed command PWM input		frequency range	100 ... 2 000	Hz
		pulse duty factor 50%	0	rpm
- Digital input		input resistance	5	k Ω
- External encoder	f_{max}		400	kHz
- Step frequency input	f_{max}		400	kHz
Connection No. 2 (white)				
- Fault output		no error	switched to GND	
- Digital output		open collector	max. $U_B / 30$ mA	
- Digital input		input resistance	100	k Ω
Connection No. 3 (red)				
- Digital input		input resistance	22	k Ω
- Electronic supply voltage ¹⁾	U_B		12 ... 30	V DC
Encoder:				
- Scanning rate			100	μ s
- Resolution internal encoder			3 000	Inc./turn

The signal level of the digital inputs can be set using the above commands:
 Standard (PLC): Low 0...7V / High 12,5V... U_B , TTL: Low 0...0,5V / High 3,5V... U_B

¹⁾ A separate supply for motor and drive electronic is optional available (important for safety-relevant applications), here escapes the digital input, connection 3 (red).

²⁾ Preset value. Can be changed over the interface.

Position control



Brushless DC-Servomotor with integrated Motion Controller

General description

The 3564 K 024 B CS combines an electronically commutated DC-Servomotor, a **high-resolution encoder** to determine actual position and a programmable position and speed controller, based on a high-capacity digital signal processor (DSP), within a complete drive unit.

This intelligent EC servomotor performs the following drive functions:

- **Speed control** from 5 to 12 000 rpm with superior performance specifications in respect of synchronous operation and minimal torque fluctuations. A PI controller ensures observance of set-point speeds.
- **Speed profiles** such as ramp, triangular or trapezoidal movements are possible. Gentle acceleration or deceleration can be implemented without problem.
- **Positioning mode:** Positioning with a resolution of 1/3 000 revolutions. Acquisition of **reference marks and end position switches**.
- **Stepper motor mode, electronic gear** or operation with external **incremental encoder** for high-precision applications.
- **Torque control** through current regulation.
- **Self-protection** against excess temperature in the case of high loading, against over-voltage during generator operation and against under-voltage.
- **Storage** of the desired functions.
- **Storage** and execution of motion programs.

Various inputs and outputs are available for implementation of these functions:

- **Set-point input** for speed presetting.
Analogue or PWM signal can be used. The input can also read in a reference mark signal. Depending on mode, a frequency signal or external incremental encoder can also be connected.
- **Error output** (Open Collector).
Can also be reprogrammed as a rotational direction or reference mark input.
- **RS232 interface** for connection to a PC with a transfer rate of up to 115k baud. The information can be stored in the integrated memory (FLASH). The interface also offers the facility to retrieve online operating data and values.
- **Additional digital input.**

An extensive ASCII command set is available for **programming** and operation. This can be preset from the PC, e.g. via any terminal program, as contained in Windows, or via any other control computer.

For Windows 95/98/ME/NT/2000/XP, the **"Faulhaber Motion Manager"** program is available; this considerably simplifies operation and configuration of the units via the RS232 interface and also enables graphic online analysis of the operating data.

Once programmed as a speed or position controller via the analogue input, as a stepper motor or electronic gear, the drive can be operated independently of the RS232 interface.

Fields of application

Thanks to the integrated technology, the drive can be used in many different areas with minimal wiring effort. The flexible connection options open up a broad field of application in all areas, for example in decentralised systems of automation technology, as well as in pick-and-place machines and machine tools.

Options

An adapter board and serial null modem cable can also be ordered, to enable immediate commissioning of the 3564 K 024 B CS.

Separate supply of motor and control electronics is possible (important for safety-relevant applications); in this case the 3rd input is not required.

Special preconfiguration of modes and parameters is possible on request.

The Motion Manager program is available on request or on the Internet.

Note

A detailed instruction manual for installation and operation are provided with the brushless DC-Servomotor.

Connection diagram

