NEW

FAULHABER

Motion Control Systems

V3.0, 4-Quadrant PWM
with RS232 or CANopen interface

76 mNm
32 W

MCS 3242 ... BX4 RS/CO

Values at 22°C and nominal voltage			MCS 3242G024BX4 ..	
Power supply for electronic	U_P		12 ... 50	V DC
Power supply for motor	U_{mot}		0 ... 50	V DC
Nominal voltage for motor	U_N		24	V
No-load speed (at U_N)	n_0		4 900	min^{-1}
Peak torque (S2 operation for max. 1s)	$M_{max.}$		150	mNm
Torque constant	k_m		41,4	mNm/A
PWM switching frequency	f_{PWM}		100	kHz
Efficiency electronic	η		95	%
Standby current for electronic (at 24V)	I_{el}		0,06	A
Shaft bearings		ball bearings, preloaded		
Shaft load max.:				
– with shaft diameter		5		mm
– radial at 3 000 min^{-1} (5 mm from mounting flange)		50		N
– axial at 3 000 min^{-1} (push / pull)		5		N
– axial at standstill (push / pull)		50		N
Shaft play:				
– radial		≤ 0,015		mm
– axial		= 0		mm
Operating temperature range		-40 ... +100		°C
Speed range (up to 30V)		1 ... 6 200		min^{-1}
Housing material		aluminium, stainless steel		
Protection class, with option V ring		IP 54		
Mass		340		g

Rated values for continuous operation				
Rated torque	M_N		76	mNm
Rated current (thermal limit)	I_N		1,82	A
Rated speed	n_N		2 800	min^{-1}

Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature.

Interface	... RS	... CO
Configuration from MotionManager 6.0	RS232	CANopen
Fieldbus	RS232	CANopen

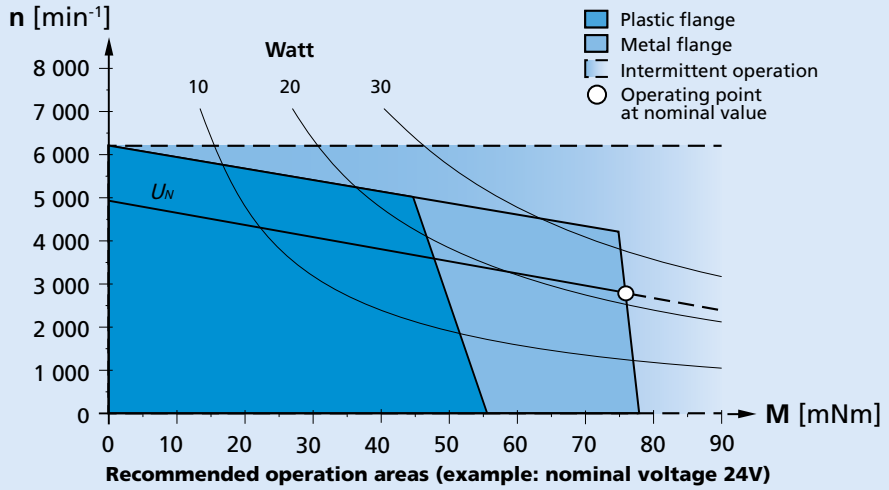
Range of functions	MCS
Operating modes	PP, PV, PT, CSP, CSV, CST and homing acc. to IEC 61800-7-201 or IEC 61800-7-301 as well as position-, speed- and torque control via analog setpoint or voltage controller
Speed range	See motor diagram
Application programs	Max. 8 application programs (BASIC), one of which is an autostart function
Additional functions	Touch-probe input, connection of a second incremental encoder, control of a holding brake
Indicator	LEDs for displaying the operating state
	Trace as recorder (scope function) or logger

Note:

The display shows the range of possible operation points of the drives at a given ambient temperature of 22°C.

The diagram indicates the recommended speed in relation to the available torque at the output shaft.
It includes the assembly on a plastic- as well as on a metal flange (assembly method: IM B 5).

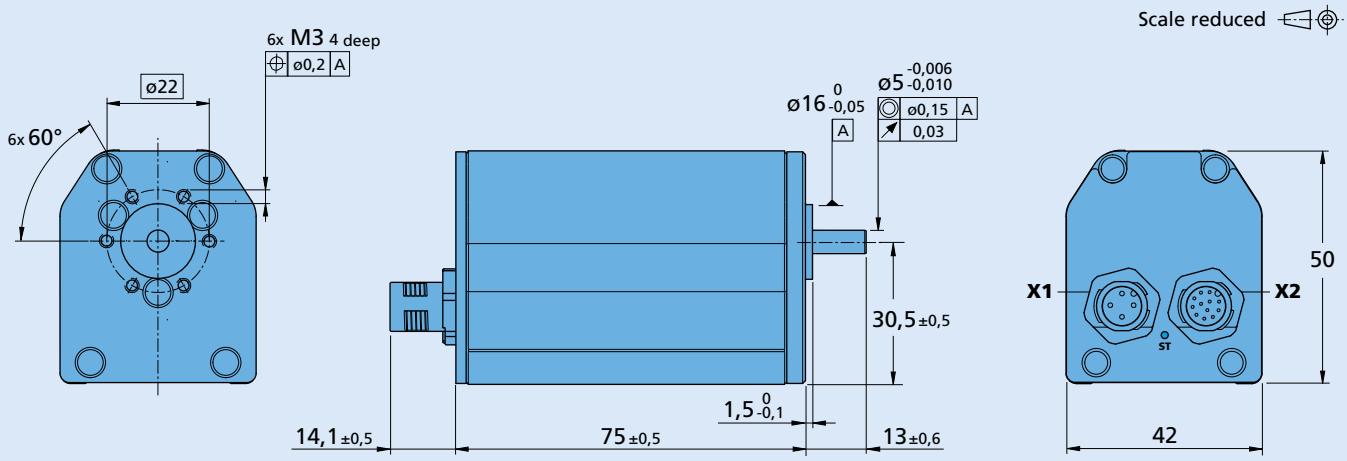
The nominal voltage linear slope describes the maximal achievable operating points at nominal voltage.
Any points of operation above this linear slope will require a supply voltage $U_{mot} > U_N$.



Recommended operation areas (example: nominal voltage 24V)

Dimensional drawing

Scale reduced



MCS 3242 G ... BX4 RS/CO

Option, cable and connection information

Example product designation: **MCS3242G024BX4RS-5453**

Option	Type	Description
5452	Shaft seal	Radial shaft seal ring
5453	Shaft seal	External V ring

Connection

Name	Function	Inputs-outputs	Description
X1	Motor and electronic power supply		
X2	Inputs / outputs	DigIn1, DigIn2, DigIn3 DigOut1, DigOut2 AnIn1, AnIn2 U_{out} / GND	TTL or. PLC level max. 0,7A continuous current ± 10V against AGND 5V

Note: For details on the connection assignment, see device manual for the MCS.

Product Combination

Precision Gearheads / Lead Screws	Encoder	Drive Electronics	Cables / Accessories
32A 32/3 32/3S 38A BS32-2.0		Integrated	6501.00255 MCS connection cable: supply plug, straight 6501.00256 MCS connection cable: supply plug, angled 6501.00257 MCS connection cable: I/O plug, straight 6501.00258 MCS connection cable: I/O plug, angled 6501.00134 BC 5004 series brake chopper 6501.00283 Adapter board MCS, RS232/CAN 6501.00284 Adapter board MCS, USB

NEW

FAULHABER

Motion Control Systems

V3.0, 4-Quadrant PWM
with EtherCAT interface

76 mNm
32 W

MCS 3242 ... BX4 ET

Values at 22°C and nominal voltage			MCS 3242G024BX4 ..	
Power supply for electronic	U_P		12 ... 50	V DC
Power supply for motor	U_{mot}		0 ... 50	V DC
Nominal voltage for motor	U_N		24	V
No-load speed (at U_N)	n_0		4 900	min^{-1}
Peak torque (S2 operation for max. 1s)	$M_{max.}$		150	mNm
Torque constant	k_m		41,4	mNm/A
PWM switching frequency	f_{PWM}		100	kHz
Efficiency electronic	η		95	%
Standby current for electronic (at 24V)	I_{el}		0,06	A
Shaft bearings		ball bearings, preloaded		
Shaft load max.:				
– with shaft diameter		5		mm
– radial at 3 000 min^{-1} (5 mm from mounting flange)		50		N
– axial at 3 000 min^{-1} (push / pull)		5		N
– axial at standstill (push / pull)		50		N
Shaft play:				
– radial		≤ 0,015		mm
– axial		= 0		mm
Operating temperature range		– 40 ... + 85		°C
Speed range (up to 30V)		1 ... 6 200		min^{-1}
Housing material		aluminium, stainless steel		
Protection class, with option V ring		IP 54		
Mass		356		g

Rated values for continuous operation				
Rated torque	M_N		76	mNm
Rated current (thermal limit)	I_N		1,82	A
Rated speed	n_N		2 800	min^{-1}

Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature.

Interface	... ET
Configuration from MotionManager 6.0	RS232
Fieldbus	EtherCAT

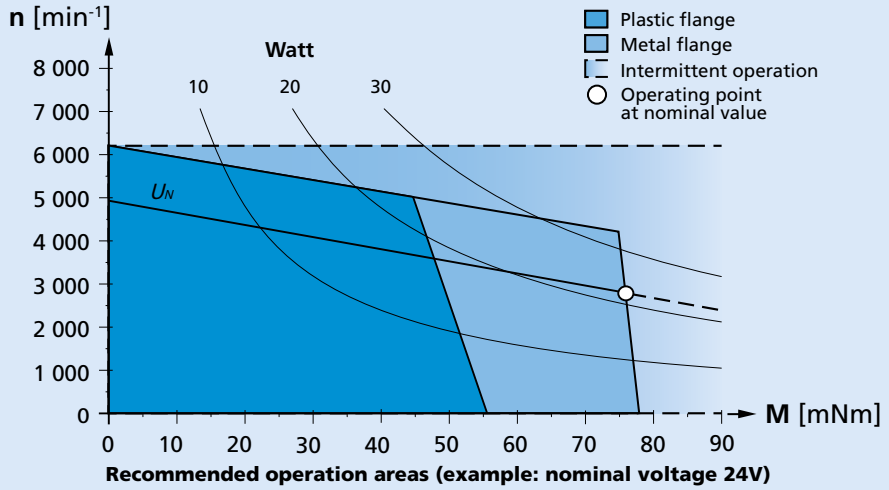
Range of functions	MCS
Operating modes	PP, PV, PT, CSP, CSV, CST and homing acc. to IEC 61800-7-201 or IEC 61800-7-301 as well as position-, speed- and torque control via analog setpoint or voltage controller
Speed range	see motor diagram
Application programs	Max. 8 application programs (BASIC), one of which is an autostart function
Additional functions	Touch-probe input, connection of a second incremental encoder, control of a holding brake
Indicator	LEDs for displaying the operating state Trace as recorder (scope function) or logger

Note:

The display shows the range of possible operation points of the drives at a given ambient temperature of 22°C.

The diagram indicates the recommended speed in relation to the available torque at the output shaft.
It includes the assembly on a plastic- as well as on a metal flange (assembly method: IM B 5).

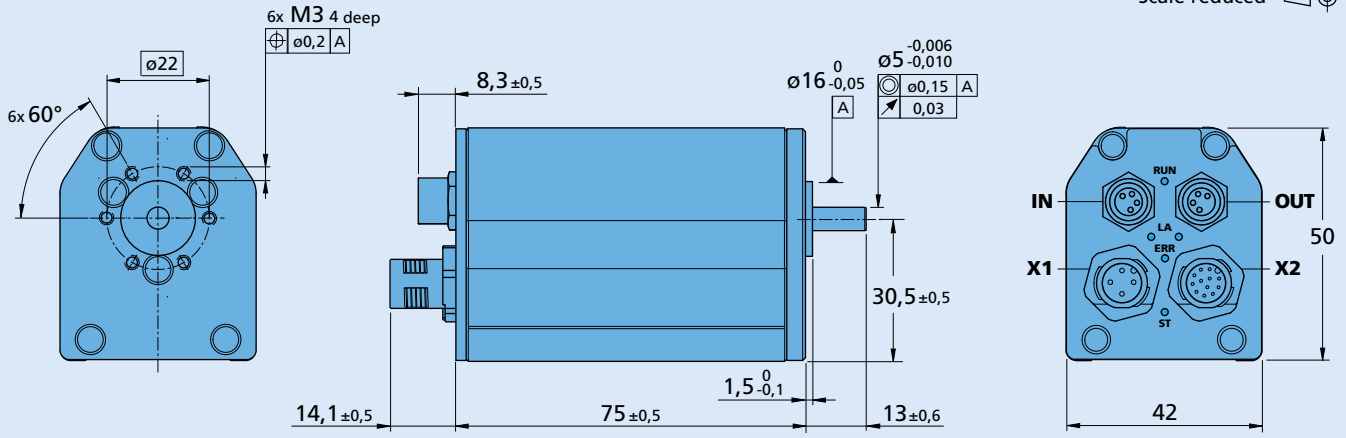
The nominal voltage linear slope describes the maximal achievable operating points at nominal voltage.
Any points of operation above this linear slope will require a supply voltage $U_{mot} > U_N$.



Recommended operation areas (example: nominal voltage 24V)

Dimensional drawing

Scale reduced



MCS 3242 G ... BX4 ET

Option, cable and connection information

Example product designation: **MCS3242G024BX4ET-5453**

Option	Type	Description
5452	Shaft seal	Radial shaft seal ring
5453	Shaft seal	External V-ring

Connection

Name	Function	Inputs-outputs	Description
X1	Motor and electronic power supply		
X2	Inputs-outputs	DigIn1, DigIn2, DigIn3 DigOut1, DigOut2 AnIn1, AnIn2 U_{out} / GND	TTL or. PLC level max. 0,7A continuous current ± 10V against AGND 5V
IN	Fieldbus		EtherCAT IN
OUT	Fieldbus		EtherCAT OUT

Note: For details on the connection assignment, see device manual for the MCS.

Product Combination

Precision Gearheads / Lead Screws	Encoder	Drive Electronics	Cables / Accessories
32A 32/3 32/3S 38A BS32-2.0		Integrated	6501.00255 MCS connection cable: supply plug, straight 6501.00256 MCS connection cable: supply plug, angled 6501.00257 MCS connection cable: I/O plug, straight 6501.00258 MCS connection cable: I/O plug, angled 6501.00270 Cable EtherCAT, connector M8-M8 straight 6501.00210 EtherCAT connection cable: M8-M8 plugs 6501.00271 Cable EtherCAT, connector M8-RJ45 straight 6501.00211 EtherCAT connection cable: M8-RJ45 plugs 6501.00134 BC 5004 series brake chopper 6501.00284 Adapter board MCS, USB

NEW

FAULHABER

Motion Control Systems

V3.0, 4-Quadrant PWM
with RS232 or CANopen interface

96 mNm
41 W

MCS 3268 ... BX4 RS/CO

Values at 22°C and nominal voltage			MCS 3268G024BX4 ..	
Power supply for electronic	U_P		12 ... 50	V DC
Power supply for motor	U_{mot}		0 ... 50	V DC
Nominal voltage for motor	U_N		24	V
No-load speed (at U_N)	n_0		4 700	min^{-1}
Peak torque (S2 operation for max. 1s)	$M_{max.}$		190	mNm
Torque constant	k_m		43,5	mNm/A
PWM switching frequency	f_{PWM}		100	kHz
Efficiency electronic	η		95	%
Standby current for electronic (at 24V)	I_{el}		0,06	A
Shaft bearings		ball bearings, preloaded		
Shaft load max.:				
– with shaft diameter		5		mm
– radial at 3 000 min^{-1} (5 mm from mounting flange)		50		N
– axial at 3 000 min^{-1} (push / pull)		5		N
– axial at standstill (push / pull)		50		N
Shaft play:				
– radial		≤ 0,015		mm
– axial		= 0		mm
Operating temperature range		-40 ... +100		°C
Speed range (up to 30V)		1 ... 6 000		min^{-1}
Housing material		aluminium, stainless steel		
Protection class, with option V ring		IP 54		
Mass		378		g

Rated values for continuous operation				
Rated torque	M_N		96	mNm
Rated current (thermal limit)	I_N		2,3	A
Rated speed	n_N		3 700	min^{-1}

Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature.

Interface	... RS	... CO
Configuration from MotionManager 6.0	RS232	CANopen
Fieldbus	RS232	CANopen

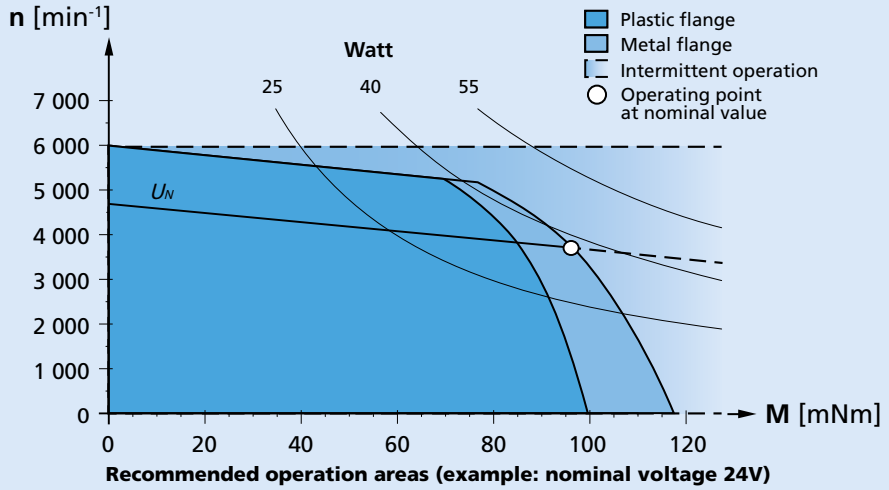
Range of functions	MCS
Operating modes	PP, PV, PT, CSP, CSV, CST and homing acc. to IEC 61800-7-201 or IEC 61800-7-301 as well as position-, speed- and torque control via analog setpoint or voltage controller
Speed range	See motor diagram
Application programs	Max. 8 application programs (BASIC), one of which is an autostart function
Additional functions	Touch-probe input, connection of a second incremental encoder, control of a holding brake
Indicator	LEDs for displaying the operating state
	Trace as recorder (scope function) or logger

Note:

The display shows the range of possible operation points of the drives at a given ambient temperature of 22°C.

The diagram indicates the recommended speed in relation to the available torque at the output shaft.
It includes the assembly on a plastic- as well as on a metal flange (assembly method: IM B 5).

The nominal voltage linear slope describes the maximal achievable operating points at nominal voltage.
Any points of operation above this linear slope will require a supply voltage $U_{mot} > U_N$.



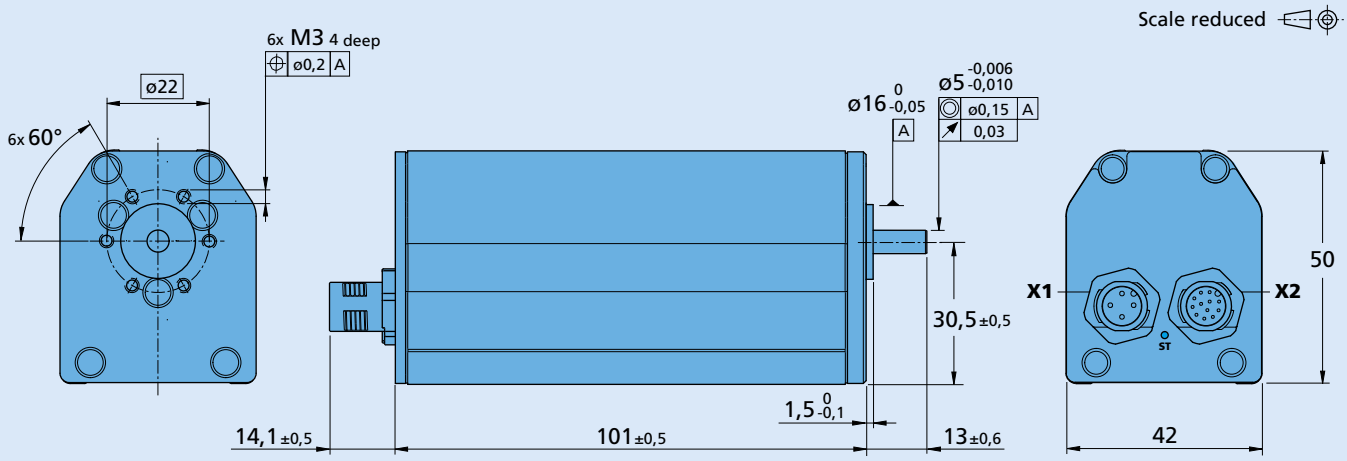
Recommended operation areas (example: nominal voltage 24V)

For notes on technical data and lifetime performance refer to "Technical Information".

Edition 2016 Apr. 01

Dimensional drawing

Scale reduced



MCS 3268 G ... BX4 RS/CO

Option, cable and connection information

Example product designation: **MCS3268G024BX4RS-5453**

Option	Type	Description
5452	Shaft seal	Radial shaft seal ring
5453	Shaft seal	External V ring

Connection

Name	Function	Inputs-outputs	Description
X1	Motor and electronic power supply		
X2	Inputs / outputs	DigIn1, DigIn2, DigIn3 DigOut1, DigOut2 AnIn1, AnIn2 U_{out} / GND	TTL or. PLC level max. 0,7A continuous current ± 10V against AGND 5V

Note: For details on the connection assignment, see device manual for the MCS.

Product Combination

Precision Gearheads / Lead Screws	Encoder	Drive Electronics	Cables / Accessories
32A 32/3 32/3S 38A BS32-2.0		Integrated	6501.00255 MCS connection cable: supply plug, straight 6501.00256 MCS connection cable: supply plug, angled 6501.00257 MCS connection cable: I/O plug, straight 6501.00258 MCS connection cable: I/O plug, angled 6501.00134 BC 5004 series brake chopper 6501.00283 Adapter board MCS, RS232/CAN 6501.00284 Adapter board MCS, USB

NEW

FAULHABER

Motion Control Systems

V3.0, 4-Quadrant PWM
with EtherCAT interface

96 mNm
41 W

MCS 3268 ... BX4 ET

Values at 22°C and nominal voltage			MCS 3268G024BX4 ..	
Power supply for electronic	U_P		12 ... 50	V DC
Power supply for motor	U_{mot}		0 ... 50	V DC
Nominal voltage for motor	U_N		24	V
No-load speed (at U_N)	n_0		4 700	min^{-1}
Peak torque (S2 operation for max. 1s)	$M_{max.}$		190	mNm
Torque constant	k_m		43,5	mNm/A
PWM switching frequency	f_{PWM}		100	kHz
Efficiency electronic	η		95	%
Standby current for electronic (at 24V)	I_{el}		0,06	A
Shaft bearings		ball bearings, preloaded		
Shaft load max.:				
– with shaft diameter		5		mm
– radial at 3 000 min^{-1} (5 mm from mounting flange)		50		N
– axial at 3 000 min^{-1} (push / pull)		5		N
– axial at standstill (push / pull)		50		N
Shaft play:				
– radial		≤ 0,015		mm
– axial		= 0		mm
Operating temperature range		– 40 ... + 85		°C
Speed range (up to 30V)		1 ... 6 000		min^{-1}
Housing material		aluminium, stainless steel		
Protection class, with option V ring		IP 54		
Mass		394		g

Rated values for continuous operation				
Rated torque	M_N		96	mNm
Rated current (thermal limit)	I_N		2,3	A
Rated speed	n_N		3 700	min^{-1}

Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature.

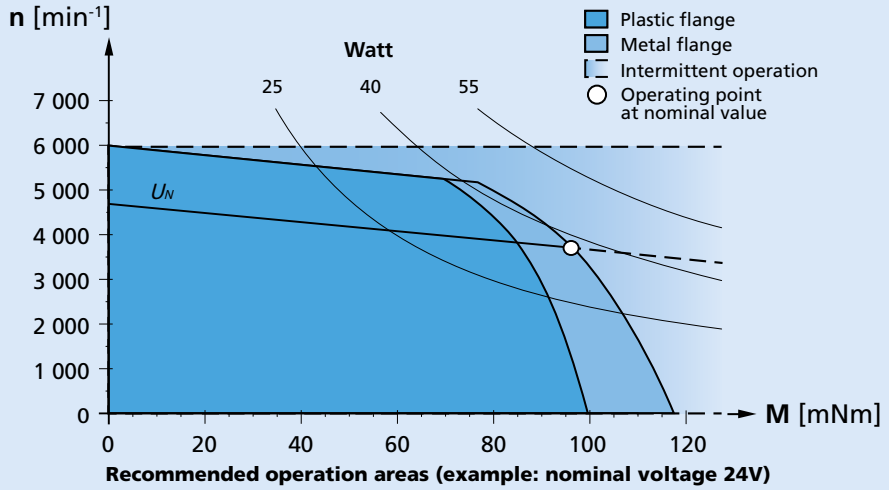
Interface	... ET
Configuration from MotionManager 6.0	RS232
Fieldbus	EtherCAT

Range of functions	MCS
Operating modes	PP, PV, PT, CSP, CSV, CST and homing acc. to IEC 61800-7-201 or IEC 61800-7-301 as well as position-, speed- and torque control via analog setpoint or voltage controller
Speed range	see motor diagram
Application programs	Max. 8 application programs (BASIC), one of which is an autostart function
Additional functions	Touch-probe input, connection of a second incremental encoder, control of a holding brake
Indicator	LEDs for displaying the operating state Trace as recorder (scope function) or logger

Note:
The display shows the range of possible operation points of the drives at a given ambient temperature of 22°C.

The diagram indicates the recommended speed in relation to the available torque at the output shaft.
It includes the assembly on a plastic- as well as on a metal flange (assembly method: IM B 5).

The nominal voltage linear slope describes the maximal achievable operating points at nominal voltage.
Any points of operation above this linear slope will require a supply voltage $U_{mot} > U_N$.

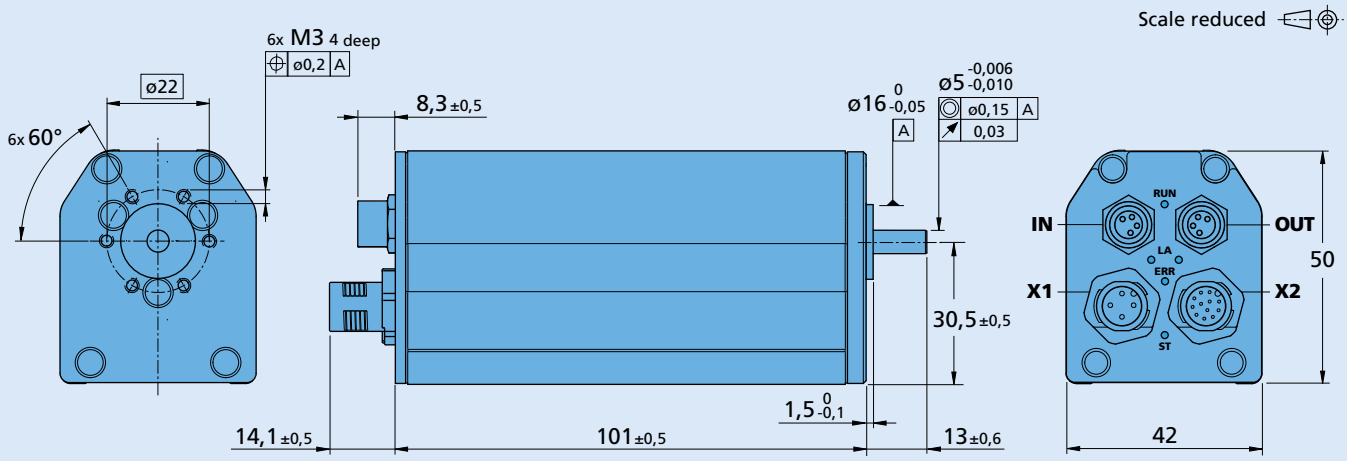


Recommended operation areas (example: nominal voltage 24V)

For notes on technical data and lifetime performance refer to "Technical Information".
Edition 2016 Apr. 01

Dimensional drawing

Scale reduced



MCS 3268 G ... BX4 ET

Option, cable and connection information

Example product designation: **MCS3268G024BX4ET-5453**

Option	Type	Description
5452	Shaft seal	Radial shaft seal ring
5453	Shaft seal	External V-ring

Connection

Name	Function	Inputs-outputs	Description
X1	Motor and electronic power supply		
X2	Inputs-outputs	DigIn1, DigIn2, DigIn3 DigOut1, DigOut2 AnIn1, AnIn2 U_{out} / GND	TTL or. PLC level max. 0,7A continuous current ± 10V against AGND 5V
IN	Fieldbus		EtherCAT IN
OUT	Fieldbus		EtherCAT OUT

Note: For details on the connection assignment, see device manual for the MCS.

Product Combination

Precision Gearheads / Lead Screws	Encoder	Drive Electronics	Cables / Accessories
32A 32/3 32/3S 38A BS32-2.0		Integrated	6501.00255 MCS connection cable: supply plug, straight 6501.00256 MCS connection cable: supply plug, angled 6501.00257 MCS connection cable: I/O plug, straight 6501.00258 MCS connection cable: I/O plug, angled 6501.00270 Cable EtherCAT, connector M8-M8 straight 6501.00210 EtherCAT connection cable: M8-M8 plugs 6501.00271 Cable EtherCAT, connector M8-RJ45 straight 6501.00211 EtherCAT connection cable: M8-RJ45 plugs 6501.00134 BC 5004 series brake chopper 6501.00284 Adapter board MCS, USB

Brushless DC-Servomotors

with integrated Motion Controller
and RS232 or CAN interface

18 mNm

For combination with
Gearheads:
22F, 22/7, 26A

2232 ... BX4 CxD

			2232 S		024 BX4 CSD/CCD/COD	
1	Nominal voltage	U_N			24	Volt
2	Terminal resistance, phase-phase	R			12,4	Ω
3	Output power [1]	$P_{2\ max.}$			6,4	W
4	Efficiency	$\eta_{max.}$			67,7	%
5	No-load speed	n_o			6 800	min^{-1}
6	No-load current [3]	I_o			0,061	A
7	Stall torque at 1,8A	M_H			57	mNm
8	Friction torque, static	C_o			0,85	mNm
9	Friction torque, dynamic	C_v			$1,5 \cdot 10^{-4}$	mNm/min^{-1}
10	Speed constant	k_n			304	min^{-1}/V
11	Back-EMF constant	k_E			3,288	mV/min^{-1}
12	Torque constant	k_M			31,40	mNm/A
13	Current constant	k_I			0,031	A/mNm
14	Slope of n-M curve	$\Delta n/\Delta M$			120	min^{-1}/mNm
15	Terminal inductance, phase-phase	L			440	µH
16	Mechanical time constant	τ_m			6,5	ms
17	Rotor inertia	J			5,2	gcm^2
18	Angular acceleration	$\alpha_{max.}$			109	$\cdot 10^3 rad/s^2$
19	Thermal resistance	R_{th1} / R_{th2}	2 / 17			K/W
20	Thermal time constant	τ_{w1} / τ_{w2}	4,1 / 360			s
21	Operating temperature range		– 25 ... + 85			°C
22	Shaft bearings		ball bearings, preloaded			
23	Shaft load max.:					
	– radial at 3 000 min^{-1} (4 mm from mounting flange)		20			N
	– axial at 3 000 min^{-1}		2			N
	– axial at standstill		20			N
24	Shaft play:					
	– radial	≤	0,015			mm
	– axial	=	0			mm
25	Housing material		stainless steel			
26	Weight		77			g
27	Direction of rotation		electronically reversible			
Recommended values - mathematically independent of each other						
28	Speed up to	$n_{e\ max.}$			5 - 8 000	min^{-1}
29	Torque up to [1] [2]	$M_{e\ max.}$			11 / 18	mNm
30	Current up to [1] [2] [3]	$I_{e\ max.}$			0,44 / 0,69	A

[1] at 4 000 min^{-1} [2] thermal resistance R_{th2} not reduced / thermal resistance R_{th2} by 55% reduced
[3] total standby current 0,04 A at U_B = 24V

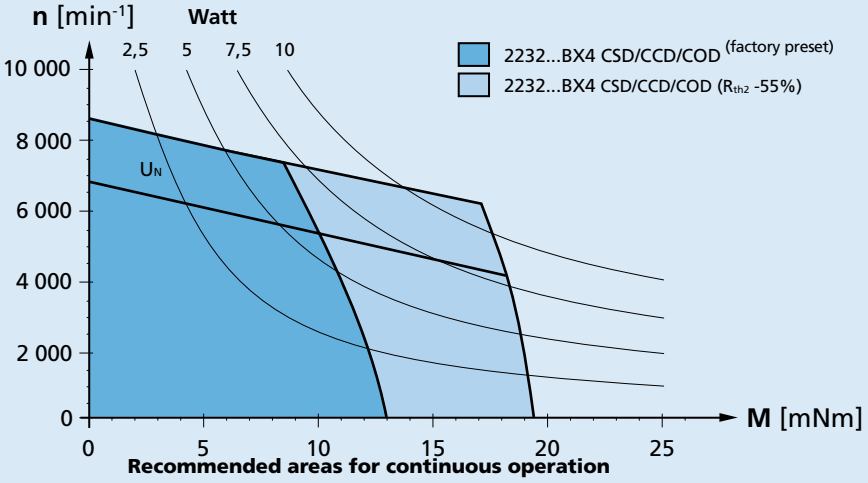
Note:

The diagram indicates the recommended speed in relation to the available torque at the output shaft for a given ambient temperature of 22°C.

The diagram shows the motor in a completely insulated as well as thermally coupled condition ($R_{th\,2}$ 55% reduced).

The motor is factory pre-configured to a continuous current for the thermally insulated condition. The controller must be reconfigured with the easy to use Motion Manager Software for use at higher continuous current.

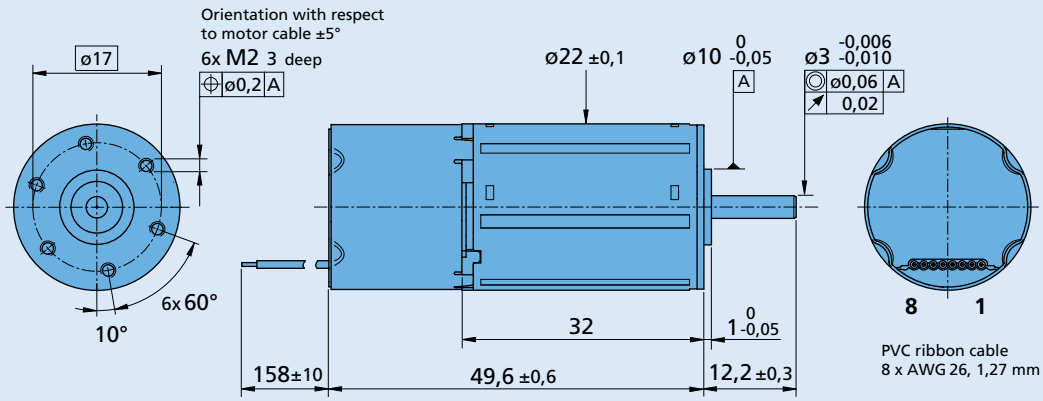
The nominal voltage (U_N) curve shows the operating point at nominal voltage in the insulated and thermally coupled condition. Any points of operation above the curve at nominal voltage will require a higher operating voltage. Any points below the nominal voltage curve will require less voltage.



For notes on technical data and lifetime performance refer to "Technical Information".

Edition 2016

Dimensional drawing



2232 ... BX4 CSD/CCD/COD

Connection

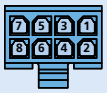
No.	Function
1	3.input
2	+24V
3	GND
4	Analog input
5	Analog GND
6	Fault output
7	RS232 RXD / CAN_L
8	RS232 TXD / CAN_H

Caution:
Incorrect lead connection will damage the motor electronics!

Options

Options

- Connector variant (Option no. 3830)
  AWG 26 / PVC ribbon cable
  with connector Micro-Fit



Accessories

- Adapter board BX4 CxD (Part No.: 6501.00113)

Full product description

- Example:
  2232S024 BX4 CSD

Motor Controller

Supply voltage [1]	U_B		5 ... 30	V DC
Peak current [2]	$I_{max.}$		3	A
Connection "Analog input":				
– Speed command analog input		voltage range	±10	V
– Speed command PWM input		frequency range	100 ... 2 000	Hz
		pulse duty factor 50%	0	min^{-1}
– Digital input		input resistance (at 24V)	5	kΩ
– External encoder	$f_{max.}$		400	kHz
– Step frequency input	$f_{max.}$		400	kHz
Connection "Fault output":				
– Fault output		no error	switched to GND	
– Digital output		open collector	max. U_B / 30 mA	
– Digital input		input resistance	100	kΩ
Connection "3.input":				
– Digital input		input resistance	22	kΩ
– Electronic supply voltage [1]	U_B		5 ... 30	V DC
Encoder:				
– Scanning rate			200	µs
– 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...4,5V / High 12,5V...U_B, TTL: Low 0...0,5V / High 2,5V...U_B

[1] Separate supply of motor and control electronics for safetyrelevant applications is optionally available (Option no. 2993).
In this case the 3rd input is not available for digital signals.
[2] Preset value. Can be changed over the interface.

Brushless DC-Servomotors

with integrated Motion Controller
and RS232 or CAN interface

35 mNm

For combination with
Gearheads:
22F, 22/7, 26A

2250 ... BX4 CxD

			2250 S		024 BX4 CSD/CCD/COD	
1	Nominal voltage	U_N			24	Volt
2	Terminal resistance, phase-phase	R			5,9	Ω
3	Output power [1]	$P_{2\ max.}$			12,2	W
4	Efficiency	$\eta_{\ max.}$			75,1	%
5	No-load speed	n_o			5 900	min^{-1}
6	No-load current [3]	I_o			0,072	A
7	Stall torque at 3A	M_H			110	mNm
8	Friction torque, static	C_o			1,20	mNm
9	Friction torque, dynamic	C_v			$2{,}4 \cdot 10^{-4}$	mNm/min^{-1}
10	Speed constant	k_n			259	min^{-1}/V
11	Back-EMF constant	k_E			3,864	mV/min^{-1}
12	Torque constant	k_M			36,90	mNm/A
13	Current constant	k_I			0,027	A/mNm
14	Slope of n-M curve	$\Delta n/\Delta M$			41,4	min^{-1}/mNm
15	Terminal inductance, phase-phase	L			240	µH
16	Mechanical time constant	$\tau_{\ m}$			4,3	ms
17	Rotor inertia	J			10	gcm^2
18	Angular acceleration	$\alpha_{\ max.}$			110	$\cdot 10^3 rad/s^2$
19	Thermal resistance	R_{th1} / R_{th2}	1,2 / 14			K/W
20	Thermal time constant	τ_{w1} / τ_{w2}	4,2 / 566			s
21	Operating temperature range		– 25 ... + 85			°C
22	Shaft bearings		ball bearings, preloaded			
23	Shaft load max.:					
	– radial at 3 000 min^{-1} (4 mm from mounting flange)		20			N
	– axial at 3 000 min^{-1}		2			N
	– axial at standstill		20			N
24	Shaft play:					
	– radial	≤	0,015			mm
	– axial	=	0			mm
25	Housing material		stainless steel			
26	Weight		117			g
27	Direction of rotation		electronically reversible			
Recommended values - mathematically independent of each other						
28	Speed up to	$n_{e\ max.}$			5 - 7 000	min^{-1}
29	Torque up to [1] [2]	$M_{e\ max.}$			22 / 35	mNm
30	Current up to [1] [2] [3]	$I_{e\ max.}$			0,7 / 1,1	A

[1] at 4 000 min^{-1} [2] thermal resistance R_{th2} not reduced / thermal resistance R_{th2} by 55% reduced
[3] total standby current 0,04 A at U_B = 24V

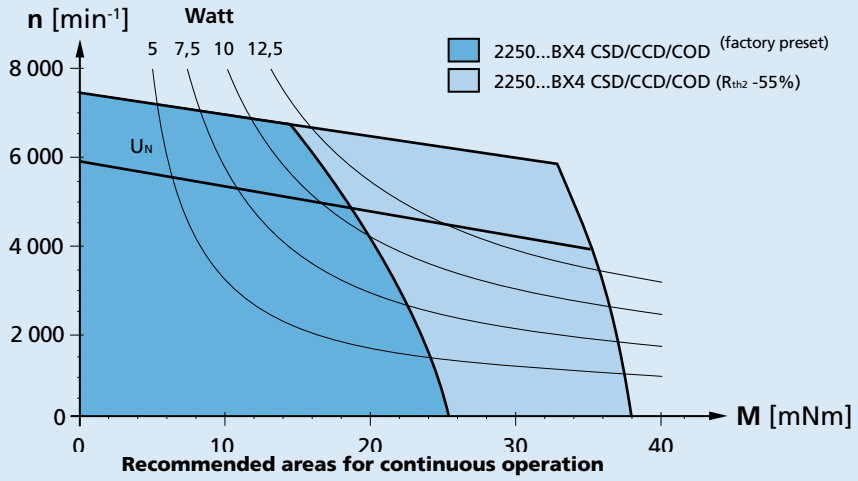
Note:

The diagram indicates the recommended speed in relation to the available torque at the output shaft for a given ambient temperature of 22°C.

The diagram shows the motor in a completely insulated as well as thermally coupled condition ($R_{th\,2}$ 55% reduced).

The motor is factory pre-configured to a continuous current for the thermally insulated condition. The controller must be reconfigured with the easy to use Motion Manager Software for use at higher continuous current.

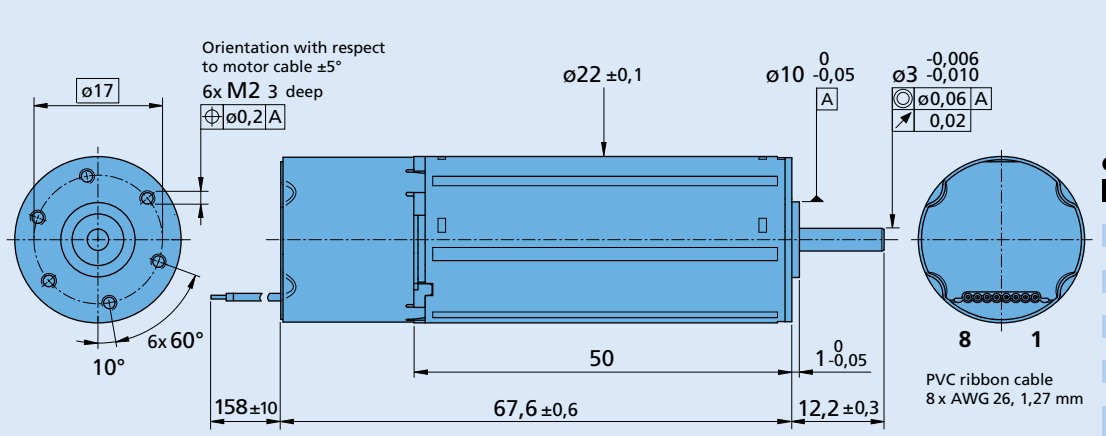
The nominal voltage (U_N) curve shows the operating point at nominal voltage in the insulated and thermally coupled condition. Any points of operation above the curve at nominal voltage will require a higher operating voltage. Any points below the nominal voltage curve will require less voltage.



For notes on technical data and lifetime performance refer to "Technical Information".

Edition 2016

Dimensional drawing



2250 ... BX4 CSD/CCD/COD

Connection

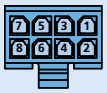
No.	Function
1	3.input
2	+24V
3	GND
4	Analog input
5	Analog GND
6	Fault output
7	RS232 RXD / CAN_L
8	RS232 TXD / CAN_H

Caution:
Incorrect lead connection will damage the motor electronics!

Options

Options

- Connector variant (Option no. 3830)
  AWG 26 / PVC ribbon cable
  with connector Micro-Fit



Accessories

- Adapter board BX4 CxD (Part No.: 6501.00113)

Full product description

- Example:
  2250S024 BX4 CSD

Motion Controller

Supply voltage [1]	U_B		5 ... 30	V DC
Peak current [2]	$I_{max.}$		3	A
Connection "Analog input":				
– Speed command analog input		voltage range	±10	V
– Speed command PWM input		frequency range	100 ... 2 000	Hz
		pulse duty factor 50%	0	min^{-1}
– Digital input		input resistance (at 24V)	5	kΩ
– External encoder	$f_{max.}$		400	kHz
– Step frequency input	$f_{max.}$		400	kHz
Connection "Fault output":				
– Fault output		no error	switched to GND	
– Digital output		open collector	max. U_B / 30 mA	
– Digital input		input resistance	100	kΩ
Connection "3.input":				
– Digital input		input resistance	22	kΩ
– Electronic supply voltage [1]	U_B		5 ... 30	V DC
Encoder:				
– Scanning rate			200	µs
– 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...4,5V / High 12,5V...U_B, TTL: Low 0...0,5V / High 2,5V...U_B

[1] Separate supply of motor and control electronics for safetyrelevant applications is optionally available (Option no. 2993).
In this case the 3rd input is not available for digital signals.
[2] Preset value. Can be changed over the interface.

Brushless DC-Servomotors

with integrated Motion Controller
and RS232 or CAN interface

56 mNm

For combination with
Gearheads:
32A, 32ALN, 32/3, 32/3 S, 38/1, 38/1 S, 38/2, 38/2 S

3242 ... BX4 Cx

			3242 G		024 BX4 CS/CC/CO	
1	Nominal voltage	U_N			24	Volt
2	Terminal resistance, phase-phase	R			3,6	Ω
3	Output power [1]	$P_{2\ max.}$			18,2	W
4	Efficiency	$\eta_{max.}$			77,3	%
5	No-load speed	n_o			5 200	min^{-1}
6	No-load current [3]	I_o			0,098	A
7	Stall torque at 5A	M_H			209	mNm
8	Friction torque, static	C_o			1,3	mNm
9	Friction torque, dynamic	C_v			$5{,}2 \cdot 10^{-4}$	mNm/min^{-1}
10	Speed constant	k_n			227	min^{-1}/V
11	Back-EMF constant	k_E			4,409	mV/min^{-1}
12	Torque constant	k_M			42,1	mNm/A
13	Current constant	k_I			0,0238	A/mNm
14	Slope of n-M curve	$\Delta n/\Delta M$			19,4	min^{-1}/mNm
15	Terminal inductance, phase-phase	L			240	µH
16	Mechanical time constant	τ_m			6,1	ms
17	Rotor inertia	J			30	gcm^2
18	Angular acceleration	$\alpha_{max.}$			66	$\cdot 10^3 rad/s^2$
19	Thermal resistance	R_{th1} / R_{th2}	1,6 / 12,4			K/W
20	Thermal time constant	τ_{w1} / τ_{w2}	9 / 810			s
21	Operating temperature range		– 40 ... +85			°C
22	Shaft bearings		ball bearings, preloaded			
23	Shaft load max.:					
	– radial at 3 000 min^{-1} (4,5 mm from mounting flange)		50			N
	– axial at 3 000 min^{-1}		5			N
	– axial at standstill		50			N
24	Shaft play:					
	– radial	≤	0,015			mm
	– axial	=	0			mm
25	Housing material		motor: stainless steel; controller housing: zinc, black anodized			
26	Weight		370			g
27	Direction of rotation		electronically reversible			
Recommended values - mathematically independent of each other						
28	Speed up to	$n_{e\ max.}$			5 - 6 500	min^{-1}
29	Torque up to [1] [2]	$M_{e\ max.}$			35 / 56	mNm
30	Current up to [1] [2] [3]	$I_{e\ max.}$			1,00 / 1,58	A

[1] at 4 000 min^{-1} [2] thermal resistance R_{th2} not reduced / thermal resistance R_{th2} by 55% reduced
[3] total standby current 0,055 A at U_B = 24V

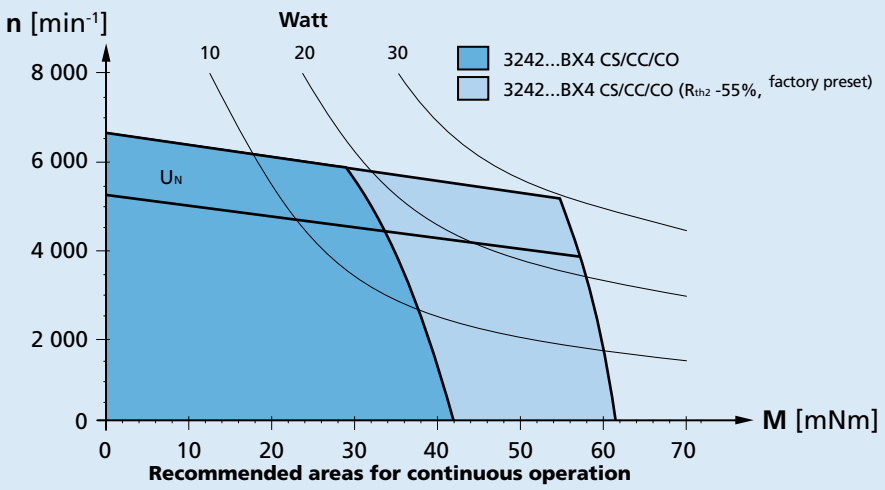
Note:

The diagram indicates the maximum speed in relation to the available torque at the output shaft for a given ambient temperature of 22°C.

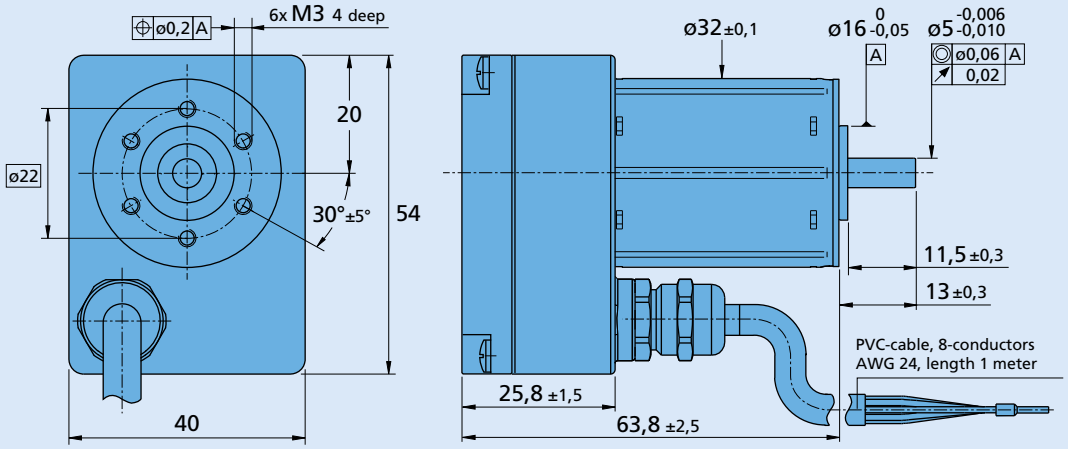
The motor can provide more power with adequate cooling (for ex. R_{th2} reduction of –55%).

The maximum available torque and speed will be reduced if the ambient temperature is higher than 22°C and/or the motor is thermally insulated to the ambient environment.

The characteristics of the curve diagram is determined by U_B and the control characteristics of the integrated Motion Controller.



Dimensional drawing



3242 ... BX4 CS/CC/CO

Scale reduced

Connection

Wires	Function
blue	GND
pink	U_B
brown	Analog input
white	Fault output
grey	Analog GND
yellow	RS232 RXD / CAN_L
green	RS232 TXD / CAN_H
red	Connection No. 3

Caution:
Connect motor supply terminals to the correct polarity. Electronics are protected against polarity reversal by an internal fuse. In case of damage, this internal fuse can only be replaced at the factory.

Options

Accessories

- Adapter board (Part No.: 6501.00065)
- Adapter board (Part No.: 6501.00159)

Full product description

- Example:

  3242G024 BX4 CS (RS232 interface)

  3242G024 BX4 CC (CANopen with FAULHABER CAN)

  3242G024 BX4 CO (CANopen CiA)

Motion Controller

Supply voltage [1]	U_B		12 ... 30	V DC
Peak current [2]	$I_{max.}$		5	A
Input/output			3	
Connection "Analog input":				
– Speed command analog input		voltage range	±10	V
– Speed command PWM input		frequency range	100 ... 2 000	Hz
		pulse duty factor 50%	0	min^{-1}
– Digital input		input resistance (at 24V)	5	kΩ
– External encoder	$f_{max.}$		400	kHz
– Step frequency input	$f_{max.}$		400	kHz
Connection "Fault output":				
– Fault output		no error	switched to GND	
– Digital output		open collector	max. U_B / 30 mA	
– Digital input		input resistance	100	kΩ
Connection "3.input":				
– Digital input		input resistance	22	kΩ
– Electronic supply voltage [1]	U_{EL}		12 ... 30	V DC
Encoder:				
– Scanning rate			200	µs
– 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...7,0V / High 12,5V...U_B, TTL: Low 0...0,5V / High 3,5V...U_B

[1] Separate supply of motor and control electronics for safetyrelevant applications is optionally available (Option no. 2993).
In this case the 3rd input is not available for digital signals; connection 3.

[2] Preset value. Can be changed over the interface.

Brushless DC-Servomotors

with integrated Motion Controller
and RS232 or CAN interface

96 mNm

For combination with
Gearheads:
32A, 32ALN, 32/3, 32/3 S, 38/1, 38/1 S, 38/2, 38/2 S

3268 ... BX4 Cx

		3268 G		024 BX4 CS/CC/CO	
1	Nominal voltage	U_N		24	Volt
2	Terminal resistance, phase-phase	R		1,45	Ω
3	Output power [1]	$P_{2\ max.}$		29,8	W
4	Efficiency	$\eta_{\ max.}$		77,3	%
5	No-load speed	n_o		5 200	min^{-1}
6	No-load current [3]	I_o		0,203	A
7	Stall torque at 8A	M_H		346	mNm
8	Friction torque, static	C_o		1,7	mNm
9	Friction torque, dynamic	C_v		1,3 $\cdot 10^{-3}$	mNm/min^{-1}
10	Speed constant	k_n		220	min^{-1}/V
11	Back-EMF constant	k_E		4,555	mV/min^{-1}
12	Torque constant	k_M		43,5	mNm/A
13	Current constant	k_I		0,0230	A/mNm
14	Slope of n-M curve	$\Delta n/\Delta M$		7,3	min^{-1}/mNm
15	Terminal inductance, phase-phase	L		110	µH
16	Mechanical time constant	τ_{m}		4,6	ms
17	Rotor inertia	J		60	gcm^2
18	Angular acceleration	$\alpha_{max.}$		58	$\cdot 10^3 rad/s^2$
19	Thermal resistance	R_{th1} / R_{th2}	1,9 / 9,6		K/W
20	Thermal time constant	τ_{w1} / τ_{w2}	17 / 1 060		s
21	Operating temperature range		– 40 ... +85		°C
22	Shaft bearings		ball bearings, preloaded		
23	Shaft load max.:				
	– radial at 3 000 min^{-1} (4,5 mm from mounting flange)		50		N
	– axial at 3 000 min^{-1}		5		N
	– axial at standstill		50		N
24	Shaft play:				
	– radial	≤	0,015		mm
	– axial	=	0		mm
25	Housing material		motor: stainless steel; controller housing: zinc, black anodized		
26	Weight		460		g
27	Direction of rotation		electronically reversible		
Recommended values - mathematically independent of each other					
28	Speed up to	$n_{e\ max.}$		5 - 6 500	min^{-1}
29	Torque up to [1] [2]	$M_{e\ max.}$		58 / 96	mNm
30	Current up to [1] [2] [3]	$I_{e\ max.}$		1,60 / 2,65	A

[1] at 4 000 min^{-1} [2] thermal resistance R_{th2} not reduced / thermal resistance R_{th2} by 55% reduced
[3] total standby current 0,055 A at U_B = 24V

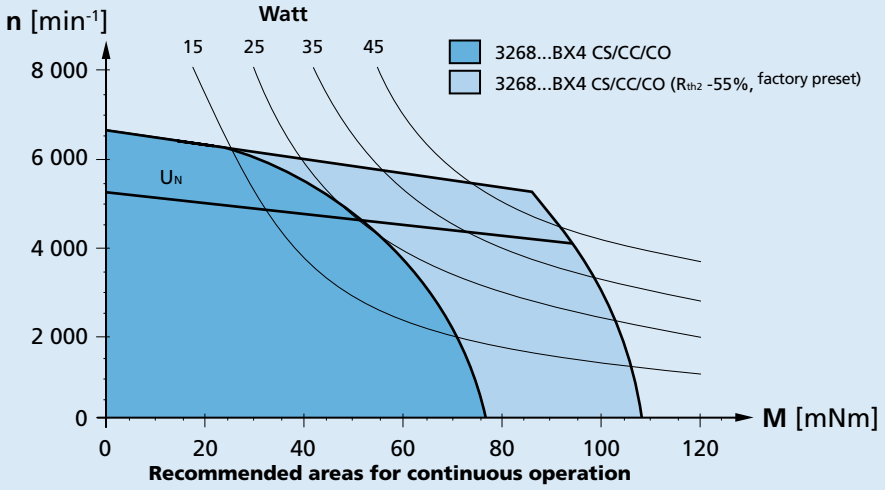
Note:

The diagram indicates the maximum speed in relation to the available torque at the output shaft for a given ambient temperature of 22°C.

The motor can provide more power with adequate cooling (for ex. R_{th2} reduction of –55%).

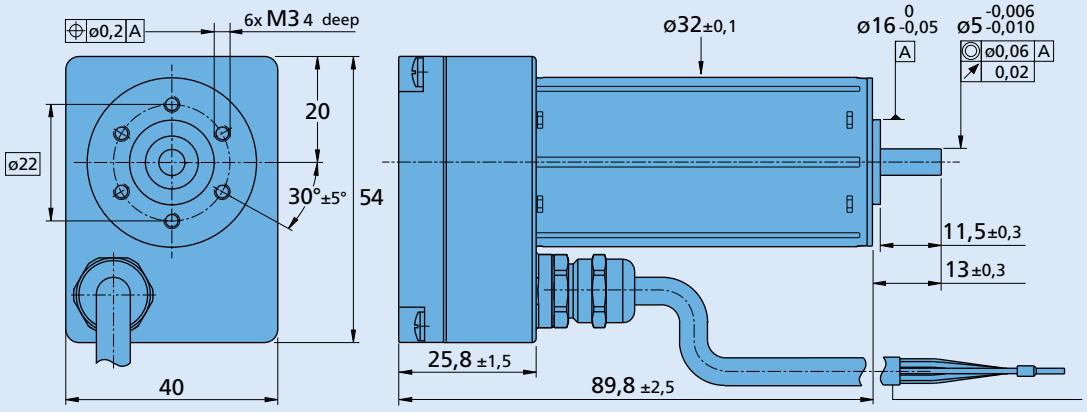
The maximum available torque and speed will be reduced if the ambient temperature is higher than 22°C and/or the motor is thermally insulated to the ambient environment.

The characteristics of the curve diagram is determined by U_b and the control characteristics of the integrated Motion Controller.



Dimensional drawing

Scale reduced



3268 ... BX4 CS/CC/CO

Connection

Wires	Function
blue	GND
pink	U_B
brown	Analog input
white	Fault output
grey	Analog GND
yellow	RS232 RXD / CAN_L
green	RS232 TXD / CAN_H
red	Connection No. 3

Caution:
Connect motor supply terminals to the correct polarity. Electronics are protected against polarity reversal by an internal fuse. In case of damage, this internal fuse can only be replaced at the factory.

Options

Accessories

- Adapter board (Part No.: 6501.00065)
- Adapter board (Part No.: 6501.00159)

Full product description

- Example:
  3268G024 BX4 CS (RS232 interface)
  3268G024 BX4 CC (CANopen with FAULHABER CAN)
  3268G024 BX4 CO (CANopen CiA)

Motion Controller

Supply voltage [1]	U_B		12 ... 30	V DC
Peak current [2]	$I_{max.}$		8	A
Input/output			3	
Connection "Analog input":				
– Speed command analog input		voltage range	±10	V
– Speed command PWM input		frequency range	100 ... 2 000	Hz
		pulse duty factor 50%	0	min^{-1}
– Digital input		input resistance (at 24V)	5	kΩ
– External encoder	$f_{max.}$		400	kHz
– Step frequency input	$f_{max.}$		400	kHz
Connection "Fault output":				
– Fault output		no error	switched to GND	
– Digital output		open collector	max. U_B / 30 mA	
– Digital input		input resistance	100	kΩ
Connection "3.input":				
– Digital input		input resistance	22	kΩ
– Electronic supply voltage [1]	U_{EL}		12 ... 30	V DC
Encoder:				
– Scanning rate			200	µs
– 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...7,0V / High 12,5V...U_B, TTL: Low 0...0,5V / High 3,5V...U_B

[1] Separate supply of motor and control electronics for safetyrelevant applications is optionally available (Option no. 2993).
In this case the 3rd input is not available for digital signals; connection 3.
[2] Preset value. Can be changed over the interface.

Brushless DC-Servomotors

with integrated Motion Controller
and RS232 or CAN interface

53 mNm

For combination with
Gearheads:
30/1, 30/1 S, 32A, 32ALN, 32/3, 32/3 S, 38/1, 38/1 S, 38/2, 38/2 S

3564 ... B Cx

			3564 K		024 B CS/CC/CO	
1	Nominal voltage	U_N			24	Volt
2	Terminal resistance, phase-phase	R			1,12	Ω
3	Output power [1]	$P_{2\ max.}$			51	W
4	Efficiency	$\eta_{max.}$			82	%
5	No-load speed	n_o			10 500	min^{-1}
6	No-load current [3]	I_o			0,225	A
7	Stall torque at 8A	M_H			160	mNm
8	Friction torque, static	C_o			1,10	mNm
9	Friction torque, dynamic	C_v			$2{,}4 \cdot 10^{-4}$	mNm/min^{-1}
10	Speed constant	k_n			473	min^{-1}/V
11	Back-EMF constant	k_E			2,114	mV/min^{-1}
12	Torque constant	k_M			20,2	mNm/A
13	Current constant	k_I			0,05	A/mNm
14	Slope of n-M curve	$\Delta n/\Delta M$			26,2	min^{-1}/mNm
15	Terminal inductance, phase-phase	L			194	µH
16	Mechanical time constant	τ_m			9,3	ms
17	Rotor inertia	J			34	gcm^2
18	Angular acceleration	$\alpha_{max.}$			47	$\cdot 10^3 rad/s^2$
19	Thermal resistance	R_{th1} / R_{th2}	2,5 / 6,3			K/W
20	Thermal time constant	τ_{w1} / τ_{w2}	23 / 1 175			s
21	Operating temperature range		– 30 ... +85			°C
22	Shaft bearings		ball bearings, preloaded			
23	Shaft load max.:					
	– radial at 3 000 min^{-1} (4,5 mm from mounting flange)		108			N
	– axial at 3 000 min^{-1}		50			N
	– axial at standstill		131			N
24	Shaft play:					
	– radial	≤	0,015			mm
	– axial	=	0			mm
25	Housing material		motor: aluminium, black anodized; controller housing: zinc			
26	Weight		510			g
27	Direction of rotation		electronically reversible			

Recommended values - mathematically independent of each other					
28	Speed up to	$n_{e\ max.}$		5 - 12 000	min^{-1}
29	Torque up to [1] [2]	$M_{e\ max.}$		39 / 53	mNm
30	Current up to [1] [2] [3]	$I_{e\ max.}$		2,1 / 2,8	A

[1] at 8 400 min^{-1} [2] thermal resistance R_{th2} not reduced / thermal resistance R_{th2} by 55% reduced
[3] current for electronic plus 0,055 A at U_B = 24V

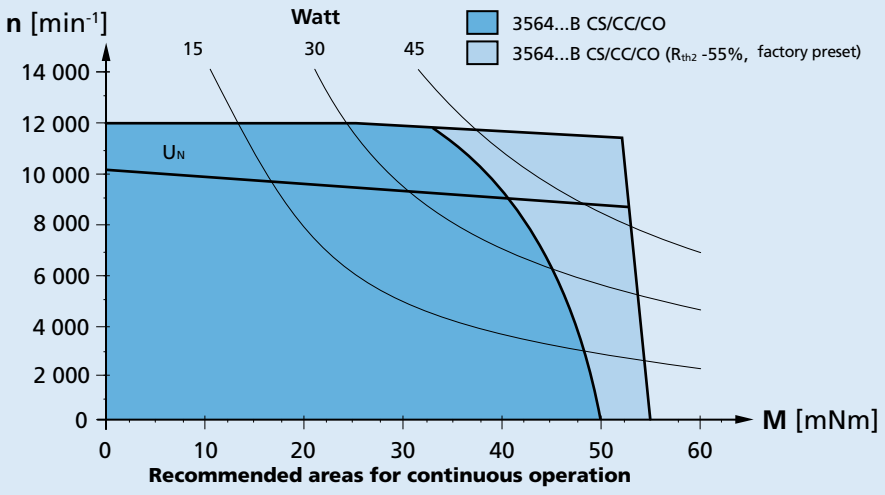
Note:

The diagram indicates the maximum speed in relation to the available torque at the output shaft for a given ambient temperature of 22°C.

The motor can provide more power with adequate cooling (for ex. R_{th2} reduction of –55%).

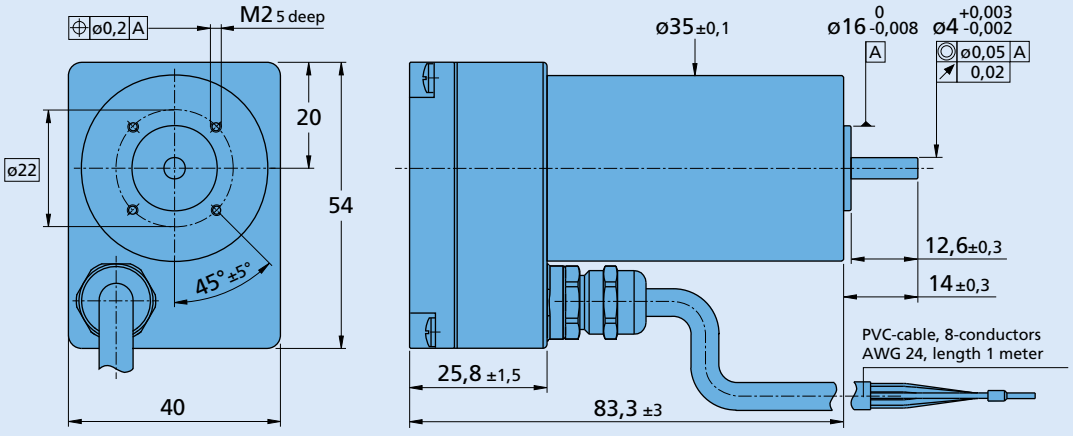
The maximum available torque and speed will be reduced if the ambient temperature is higher than 22°C and/or the motor is thermally insulated to the ambient environment.

The characteristics of the curve diagram is determined by U_B and the control characteristics of the integrated Motion Controller.



Dimensional drawing

Scale reduced



3564 ... B CS/CC/CO

Connection

Wires	Function
blue	GND
pink	UB
brown	Analog input
white	Fault output
grey	Analog GND
yellow	RS232 RXD / CAN_L
green	RS232 TXD / CAN_H
red	Connection No. 3

Caution:
Connect motor supply terminals to the correct polarity. Electronics are protected against polarity reversal by an internal fuse. In case of damage, this internal fuse can only be replaced at the factory.

Options

Accessories

- Adapter board (Part No.: 6501.00065)
- Adapter board (Part No.: 6501.00159))

Full product description

- Example:
  3564K024B CS (RS232 interface)
  3564K024B CC (CANopen with FAULHABER CAN)
  3564K024B CO (CANopen CiA)

Motion Controller

Supply voltage [1]	U_B		12 ... 30	V DC
Peak current [2]	$I_{max.}$		8	A
Input/output			3	
Connection "Analog input":				
– Speed command analog input		voltage range	±10	V
– Speed command PWM input		frequency range	100 ... 2 000	Hz
		pulse duty factor 50%	0	min^{-1}
– Digital input		input resistance (at 24V)	5	kΩ
– External encoder	$f_{max.}$		400	kHz
– Step frequency input	$f_{max.}$		400	kHz
Connection "Fault output":				
– Fault output		no error	switched to GND	
– Digital output		open collector	max. U_B / 30 mA	
– Digital input		input resistance	100	kΩ
Connection "3.input":				
– Digital input		input resistance	22	kΩ
– Electronic supply voltage [1]	U_{EL}		12 ... 30	V DC
Encoder:				
– Scanning rate			100	µs
– 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...7,0V / High 12,5V...U_B, TTL: Low 0...0,5V / High 3,5V...U_B

[1] Separate supply of motor and control electronics for safetyrelevant applications is optionally available (Option no. 2993).
In this case the 3rd input is not available for digital signals; connection 3.
[2] Preset value. Can be changed over the interface.