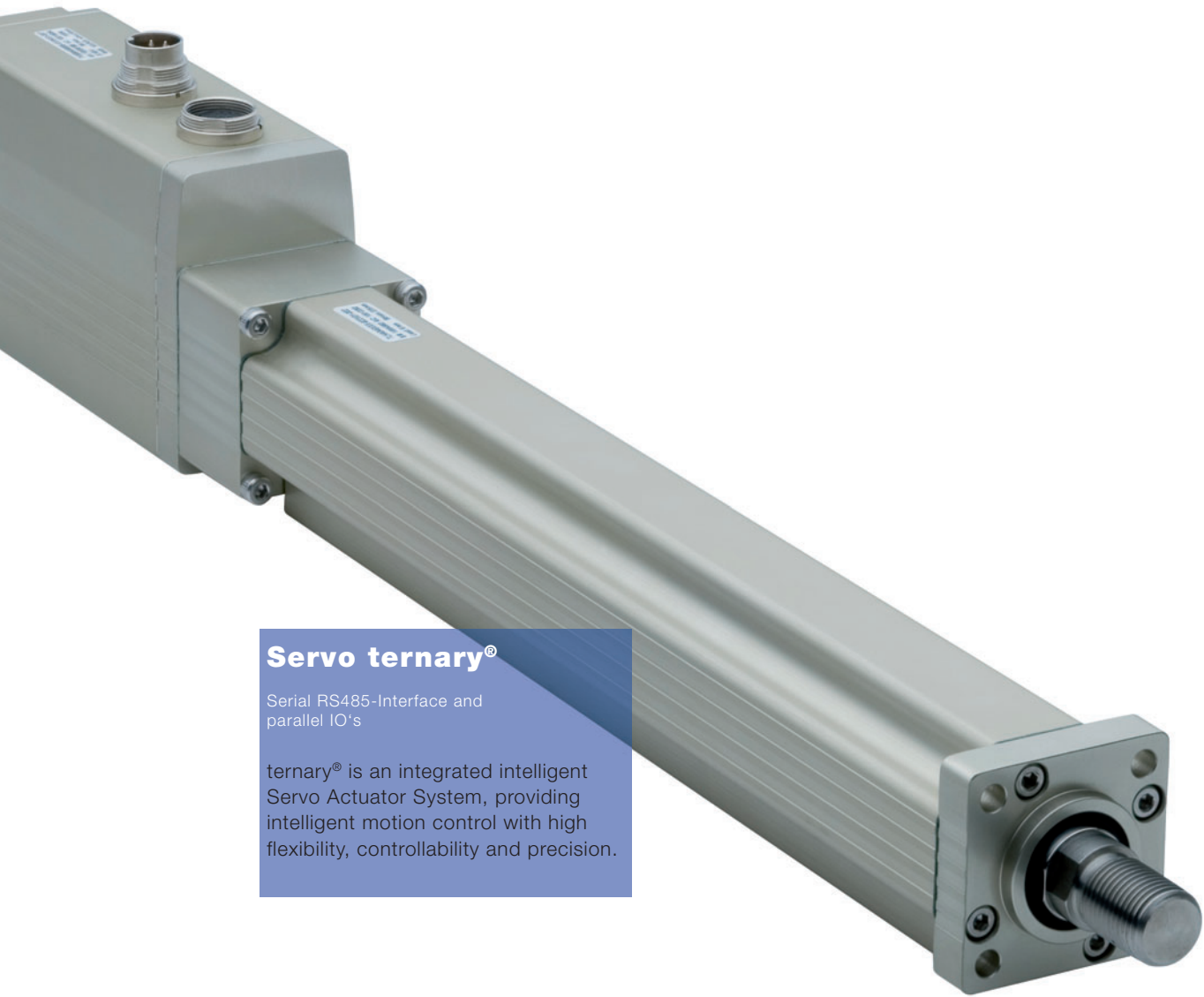


All-in-One System



Servo **ternary**[®]

Serial RS485-Interface
and parallel IO's



Servo ternary®

Serial RS485-Interface and
parallel IO's

ternary® is an integrated intelligent
Servo Actuator System, providing
intelligent motion control with high
flexibility, controllability and precision.

Actuator-System Servo ternary®

Serial RS485-Interface and parallel IO's

The “all in one solution” is an integrated closed-loop system, consisting of amplifier & controller, feedback system, brushless servo motor and mechanics – all in a single package.

- **Cabinet less** technology
- No complicated system **integration** necessary
- **Installed and setup in minutes**
- **Integrated intelligence**



WITTENSTEIN



motion control

WITTENSTEIN motion control GmbH (WMC) develops bus-compatible, electromechanical rotary and linear servo systems. These systems are characterised by the high integration of the following components: motor, precision gearhead, electronics, sensor technology and software. In addition to development, WMC is also responsible for production and sales. Servo systems from WMC are used in automation and special applications, handling systems, highly dynamic robots, machine tools and production machines.

Type	Unit	TRBB046BBB-xxxN01-007 TRBB046BBB-xxxB01-007	TRSB046BBB-xxxN05-007 TRSB046BBB-xxxB05-007	TRSB046BBB-xxxN10-007 TRSB046BBB-xxxB10-007	TRSB046BBB-xxxN25-007 TRSB046BBB-xxxB25-007
Motor type		Brushless Servo Motor			
Continuous Torque	Nm	0.27	1.0	2.0	5.0
Max. Torque	Nm	0.82	3.46	6.39	11.5
Max. Speed (drive side)	Rpm	5000	1000	500	200
Gear ratio	-	-	5	10	25
Dimensions	mm	See dimension drawing on next page			
Mechanical shaft interface	mm	∅ 7, D-Cut	∅ 12, with keyway		
Encoder resolution (drive side)	Pulses/re	2000	10000	20000	50000
	arcmin	10.8	-	-	-
Gear reducer backlash	arcmin	-	< 12	< 12	< 15
Motor rotor mass moment of inertia	x 10 ⁻⁷ kgm ²	36.5			
Moment of gear inertia of input	x 10 ⁻⁷ kgm ²	-	59	59	55
Brake holding torque ¹⁾	Nm	[0.33]	[1.65]	[3.3]	[8.25]
Maximum radial force on output shaft	N	70	650	650	650
Protection level ²⁾	-	IP65	IP64	IP64	IP64
Ambient temperature	°C	operation: 0 up to +40, storage: -20 up to +60			
Ambient humidity	%	Operation and storage: 90% RH _{max}			
Supply Power required	V, A	48 VDC ± 10%, 9 A			
Control Power	V, A	12- 48 V, 0.2 A			
Command interface	-	Serial (RS485) + Parallel I/O's			
		Optional with pulse input			
Parallel - Interface		Inputs: 8, Outputs: 5 (function programmable); refer documentation			
Number of stored positions		64			
Control functions	-	Event driven control. Position/Speed/Acceleration/Torque			

¹⁾ Only for brake-equipped.

²⁾ Caution: IP65 is a guarantee of protection against dust and low pressure water spray coming from any direction for up to 3 minutes at a time. For application outside of these rating, e. g. the use of cutting fluid or continuous spray of water, please consult WITTENSTEIN motion control technical engineers to determine additional protection measures that might be needed.

Optional holding brake

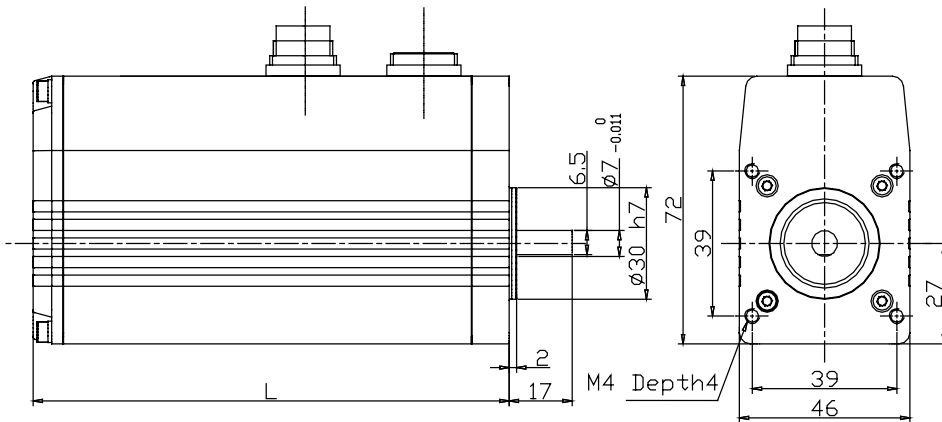
The ternary®-rotary actuator is available with an optional holding brake.

When ordered, this is integrated into the mechatronic unit. Specifications, additional dimensions and mass are:

Type	Unit	TRBB046BBB-xxxB01-007	TRSB046BBB-xxxB05-007	TRSB046BBB-xxxB10-007	TRSB046BBB-xxxB25-007
Brake holding torque	Nm	0.33	1.65	3.3	8.25
Additional length	mm	26.5			
Additional mass	kg	0.18			
Additional Moment of inertia	x10 ⁻⁷ kgm ²	87 x 10 ⁻⁷			

Note: The static holding brake cannot be used for dynamic braking.

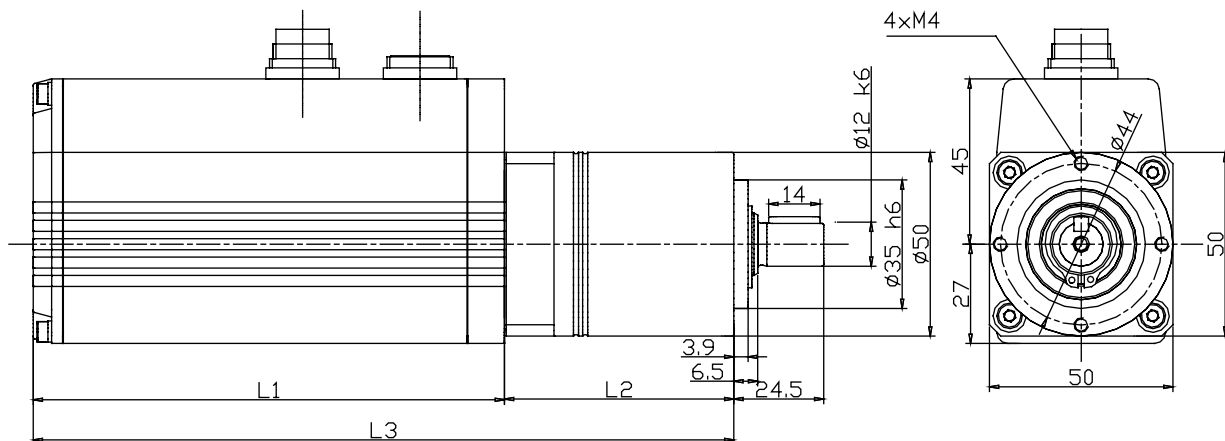
Servo ternary® TRBB046 serial RS485-interface
 Motor unit with integrated controller without planetary gear reducer



Type ■ = B = with holding brake ■ = N = without holding brake	L [mm]*	Mass [kg]*
TRBB046BBB-xxx ■ 01-007	128.5 (155)	0.8 (0.97)

*) Values in parenthesis are for brake-equipped versions.

Servo ternary® TRSB046 serial RS485-interface
 Motor unit with integrated controller and planetary gear reducer



△ Dimension drawing provided for illustration only.
 Contact WITTENSTEIN motion control technical engineers for the latest engineering drawings.
 3-D step files are available on request.

Type ■ = B = with holding brake ■ = N = without holding brake	L1 [mm]*	L2 [mm]	L3 [mm]*	Mass [kg]*	Ratio
TRSB046BBB-xxx ■ 05-007	128.5 (155)	63	191.5 (218)	1.56 (1.73)	5
TRSB046BBB-xxx ■ 10-007		63	191.5 (218)	1.56 (1.73)	10
TRSB046BBB-xxx ■ 25-007		78	206.5 (233)	1.75 (1.92)	25

*) Values in parenthesis are for brake-equipped versions.

Type	Unit	TL SB046BBB-3xxN01-007 TL SB046BBB-3xxB01-007	TL SB046BBB-6xxN01-007 TL SB046BBB-6xxB01-007	TL SB046BBB-CxxN01-007 TL SB046BBB-CxxB01-007
Motor type		Brushless Servo Motor		
Stroke	mm	25, 50, 75, 100, 150, 225, 300		
Continuous Output thrust	N	470	240	100
Max. Output thrust	N	700 (1000) ¹⁾ (600) ²⁾	700	370
Max. driving speed	mm/s	250	500	1000
Ball screw	mm	3	6	12
Dimensions	mm	See dimension drawing on next page		
Encoder resolution (2000 Pulses/rev)	mm	0.0015	0.003	0.006
Lost motion	mm	0.05		
Repeatability	mm	± 0.0045	± 0.009	± 0.018
Motor rotor mass moment of inertia	x 10 ⁻⁷ kgm ²	36.5		
Brake holding force ³⁾	N	[600]	[300]	[150]
Protection level ⁴⁾	-	IP65		
Ambient temperature	°C	Operating: 0 up to +40, Storage: -20 up to +60		
Ambient humidity	%	Operating and storage: 90% RH _{max}		
Supply power required	V, A	48 VDC ± 10%, 9 A		
Control power	V, A	12- 48 V, 0.2 A		
Interface	-	Serial (RS485) + Parallel I/O's		
		Optional with pulse input		
PIO - Interface		Input: 8, Output: 5 (Function programmable); refer documentation		
Number of stored positions		64		
Control functions	-	Event driven control. Position/Speed/Acceleration/Thrust		

¹⁾ Higher capacity 3 mm ball screw are available on request.

²⁾ Values in parenthesis indicates such higher capacity ball screw case. In case of 300 mm stroke with 3 mm lead screw, maximum thrust is limited by 600 N due to buckling capacity, even high capacity version.

³⁾ Only for brake-equipped versions.

⁴⁾ Caution: IP65 is a guarantee of protection against dust and low pressure water spray coming from any direction for up to 3 minutes at a time. For application outside of these rating, e. g. the use of cutting fluid or continuous spray of water, please consult WITTENSTEIN motion control technical engineers to determine additional protection measures that might be needed.

Optional holding brake

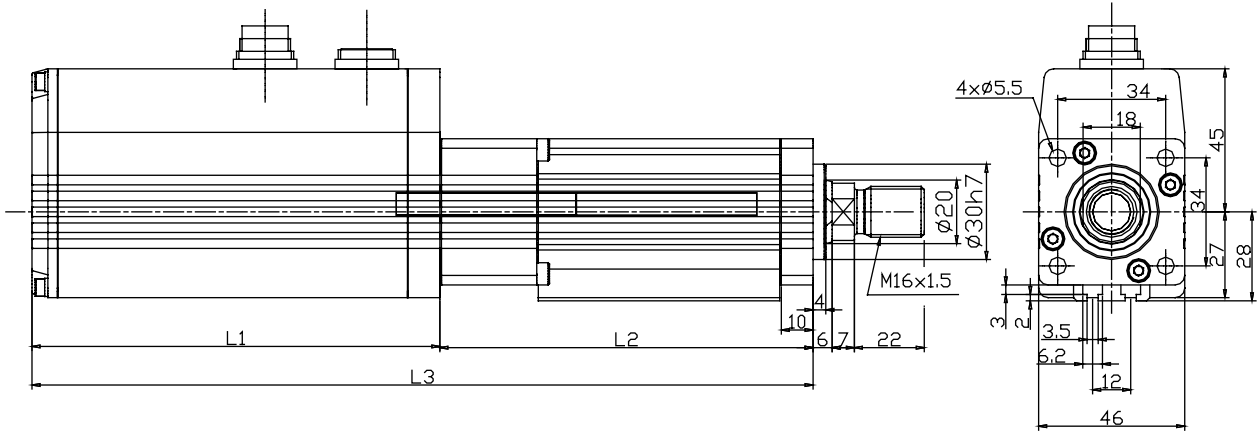
The ternary®-linear actuator is available with an optional holding brake.

When ordered, this is integrated into the mechatronic unit. Specifications, additional dimensions and mass are:

Type	Unit	TL SB046BBB-3xxB01-007	TL SB046BBB-6xxB01-007	TL SB046BBB-CxxB01-007
Brake holding torque	N	600	300	150
Additional length	mm	26.5		
Additional mass	kg	0.18		
Additional Moment of inertia	x10 ⁻⁷ kgm ²	87 x 10 ⁻⁷		

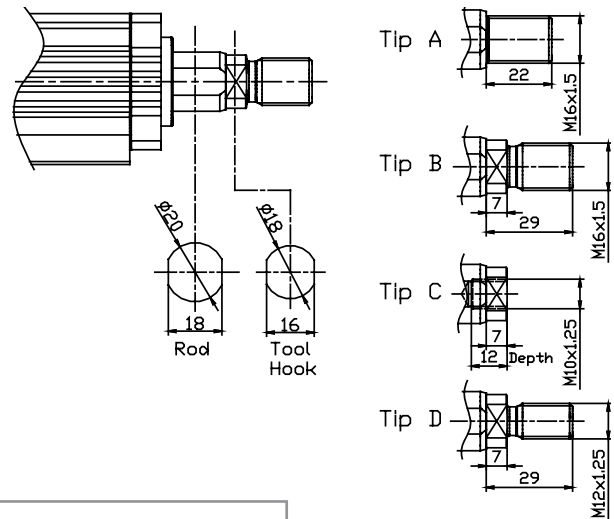
Note: The static holding brake cannot be used for dynamic braking.


Servo ternary® TLSB046 serial RS485-interface
Motor unit with integrated controller and mechanical rod



Mounting parts:		
Tip A	Male thread	M16 x 1.5
Tip B	Male thread	M16 x 1.5 double D – Cut
Tip C	Female thread	M10 x 1.25 double D – Cut
Tip D	Male thread	M12 x 1.25 double D – Cut

Double D – Cut: Wrench flats for replacement only



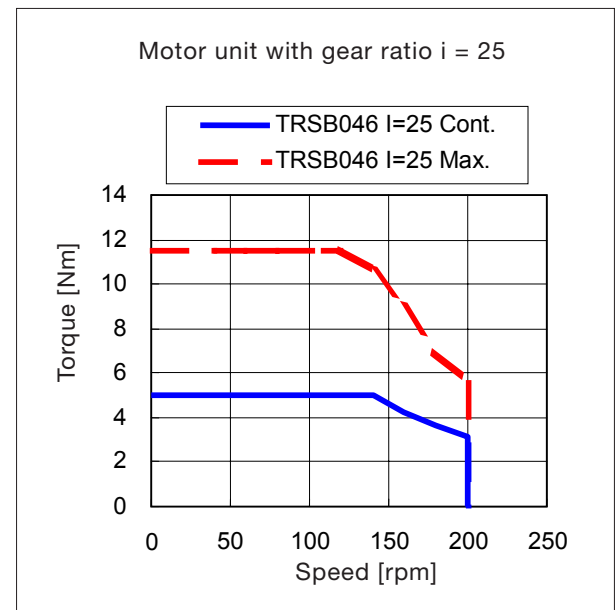
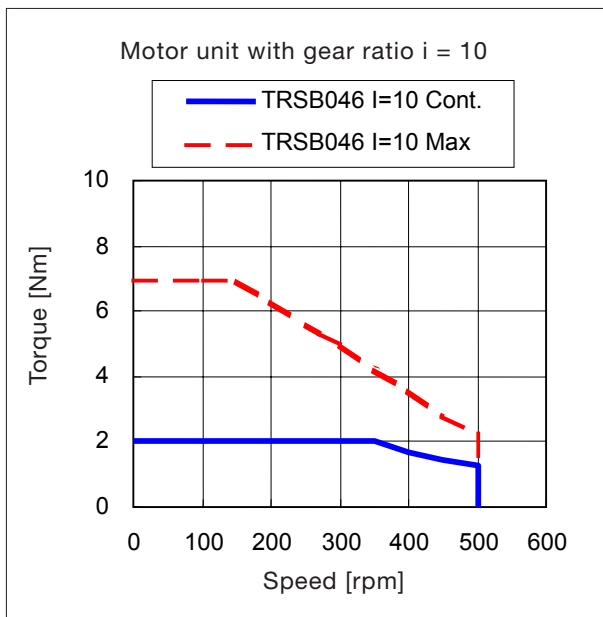
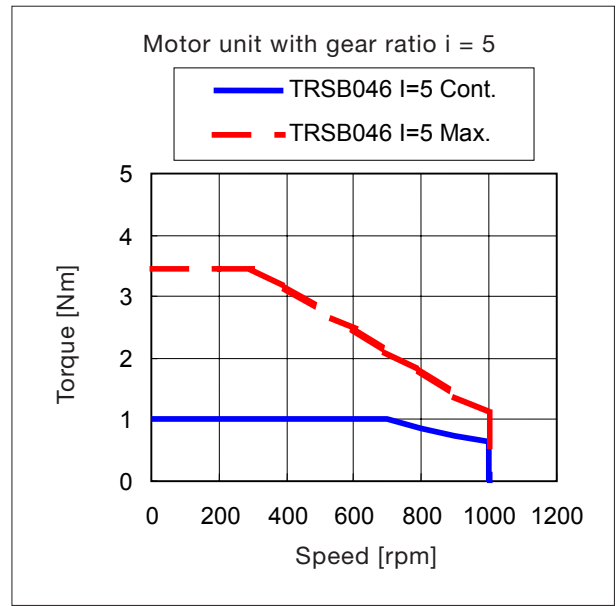
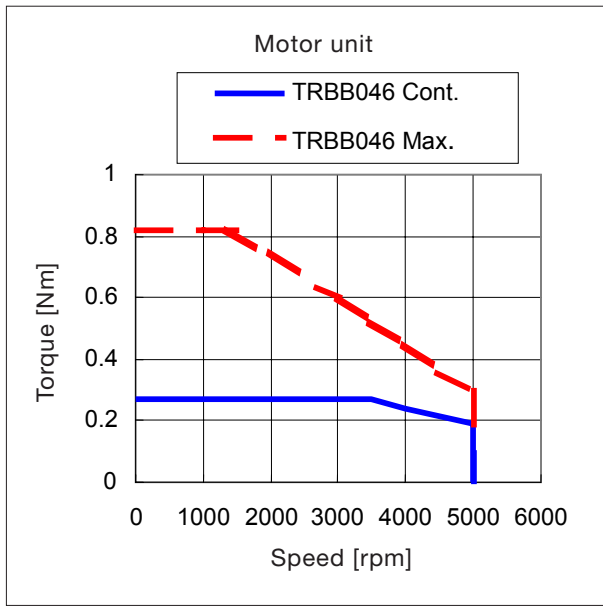
 Dimension drawing provided for illustration only.
Contact WITTENSTEIN motion control technical engineers for the latest engineering drawings.
3-D step files are available on request.

Type	● = 3,C ■ = B = with brake ■ = N = without brake	Stroke [mm]	L1 [mm]*	L2 [mm]	L3 [mm]*	Mass [kg]*
TLSB046BBB-● 02 ■ 01-007		25	128.5 (155)	117.5	246 (272.5)	1.5 (1.68)
TLSB046BBB-● 05 ■ 01-007		50		142.5	271 (297.5)	1.66 (1.84)
TLSB046BBB-● 07 ■ 01-007		75		167.5	296 (322.5)	1.79 (1.97)
TLSB046BBB-● 10 ■ 01-007		100		192.5	321 (347.5)	1.91 (2.09)
TLSB046BBB-● 15 ■ 01-007		150		242.5	371 (397.5)	2.16 (2.34)
TLSB046BBB-● 22 ■ 01-007		225		317.5	446 (472.5)	2.55 (2.73)
TLSB046BBB-● 30 ■ 01-007		300		392.5	521 (547.5)	2.93 (3.11)
TLSB046BBB-602 ■ 01-007		25		125.5	254 (280.5)	1.5 (1.68)
TLSB046BBB-605 ■ 01-007		50		150.5	279 (305.5)	1.66 (1.84)
TLSB046BBB-607 ■ 01-007		75		175.5	304 (330.5)	1.79 (1.97)
TLSB046BBB-610 ■ 01-007		100		200.5	329 (355.5)	1.91 (2.09)
TLSB046BBB-615 ■ 01-007		150		250.5	379 (405.5)	2.16 (2.34)
TLSB046BBB-622 ■ 01-007		225		325.5	454 (480.5)	2.55 (2.73)
TLSB046BBB-630 ■ 01-007		300		400.5	529 (555.5)	2.93 (3.11)

*) Values in parenthesis are for brake-equipped versions.

Characteristics

Rotary actuator TRBB046/TRSB046



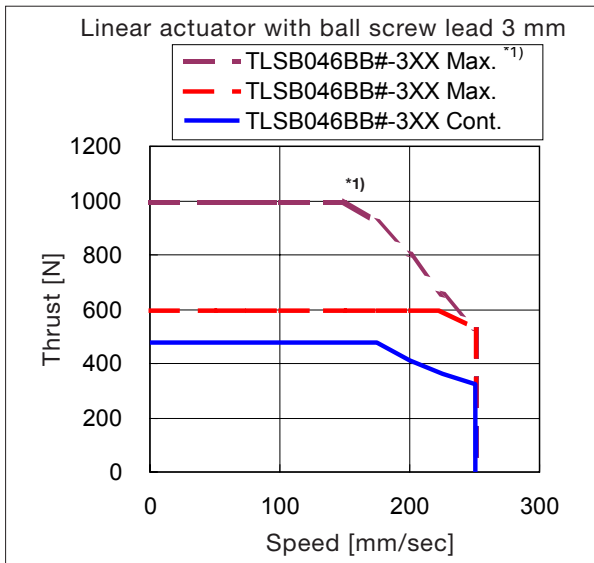
⚠ Under nominal conditions: Power supply 48 VDC at ambient temperature 40°C.

Allowable radial force on gear head

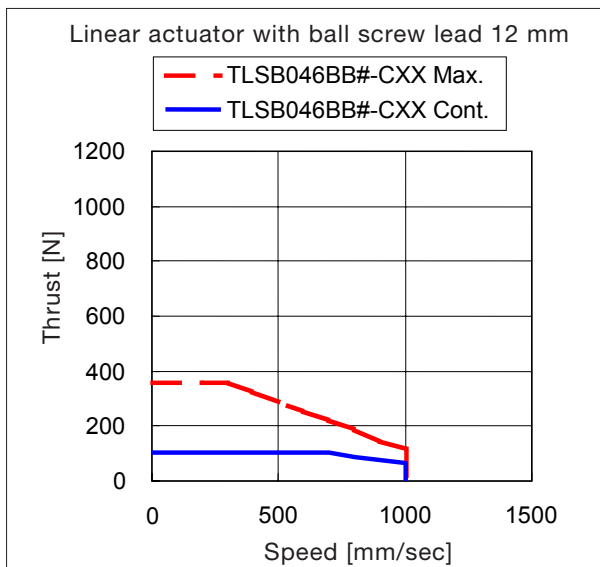
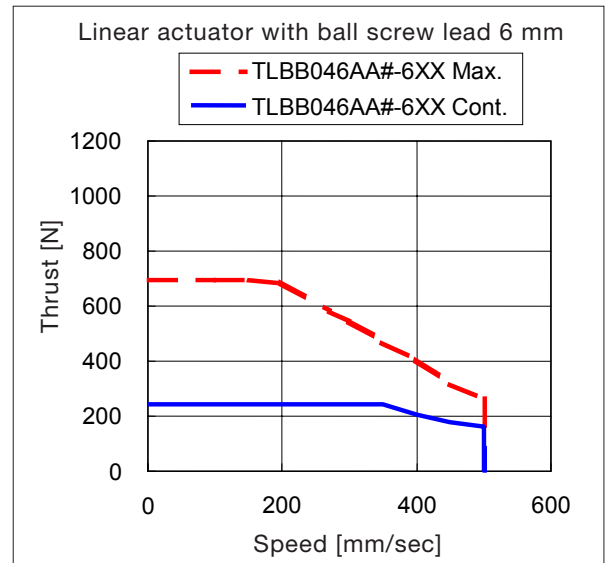
Type ■ = B = with holding brake ■ = N = without holding brake	Allowable radial force on output shaft ¹⁾ [N]	Allowable axial force on output shaft [N]
TRBB046BBB-XXX ■ 01	70	50
TRBB046BBB-XXX ■ 05		
TRBB046BBB-XXX ■ 10		
TRBB046BBB-XXX ■ 25		
	650	700

¹⁾ Radial force is specified at midpoint of the output shaft.

Linear actuator TLSB046



*1) Characteristic for high capacity cylinder.



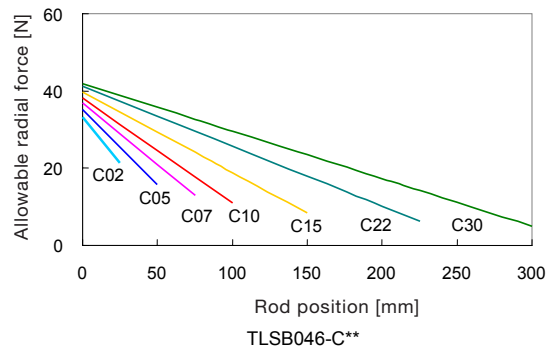
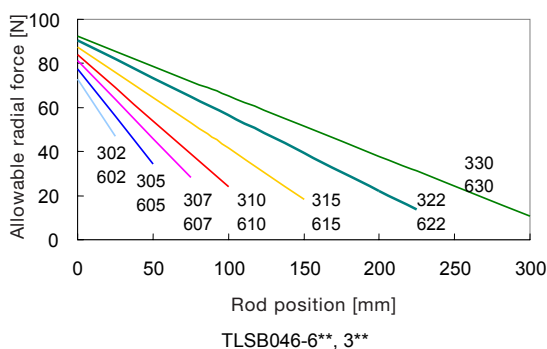
Allowable twist torque on output rod

Allowable twist torque on output rod is limited by 0,5 Nm and independent of any position of the rod.

 Under nominal conditions: Power supply 48 VDC at ambient temperature 40°C.

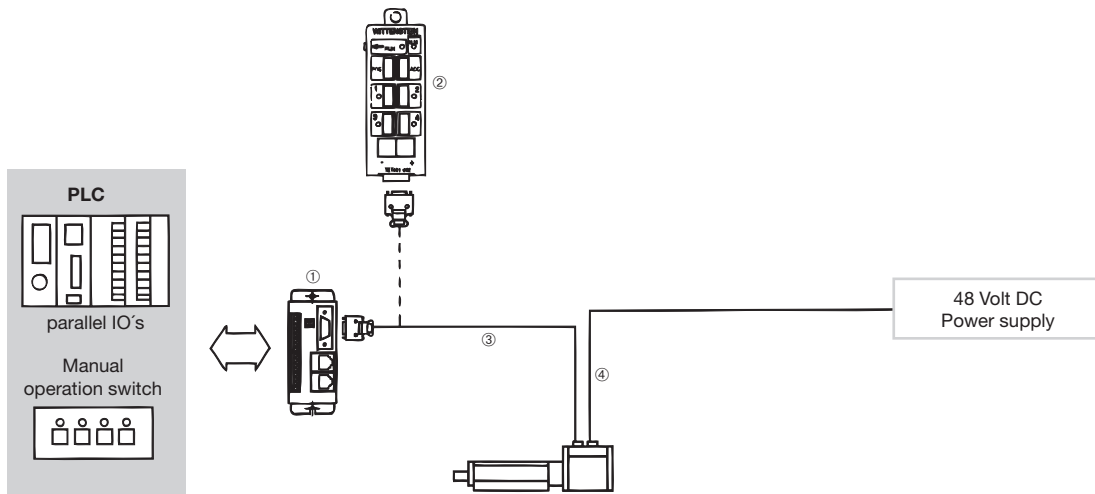
Allowable radial force

Allowable radial force is specified as the maximum value for each stroke length. Unsupported loads on the output rod should be avoided. Do not exceed the radial forces specified in the illustration. Exceeding these forces during installation or operation may result in loss of performance and/or premature wear of the actuator.



System configuration – diagrams

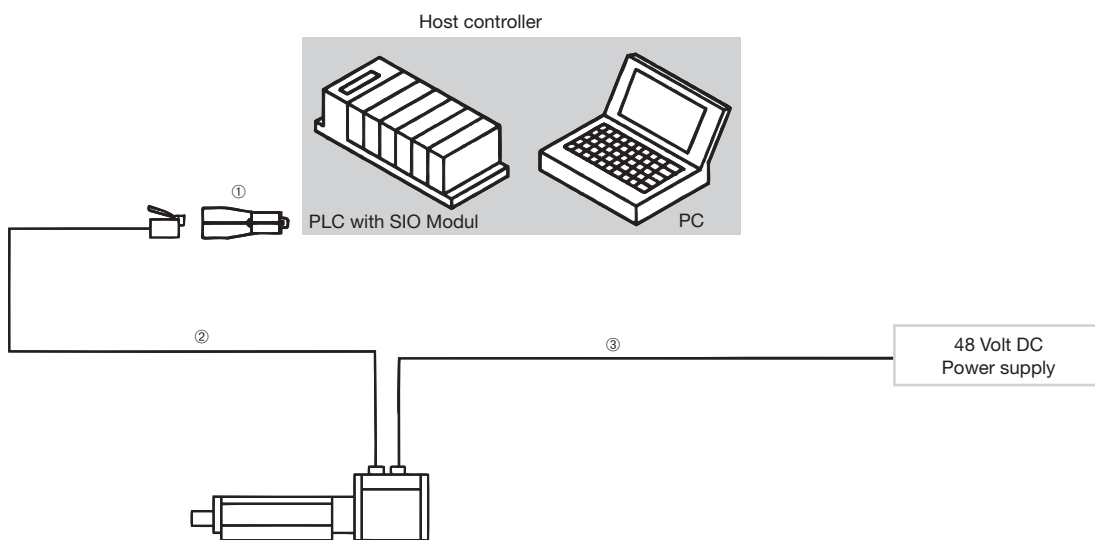
Single-axis control with parallel IO's



Accessories and cables		
①	Chaining terminal	TBG002-003
②	Teach-In patent	TET001-002
③	Command cable (SIO/PIO)	TCC002-020-***-R
④	Power cable	TCC001-007-***-R

*** indicates cable length of 1, 2, 5, 10, 15 m cables available on request.

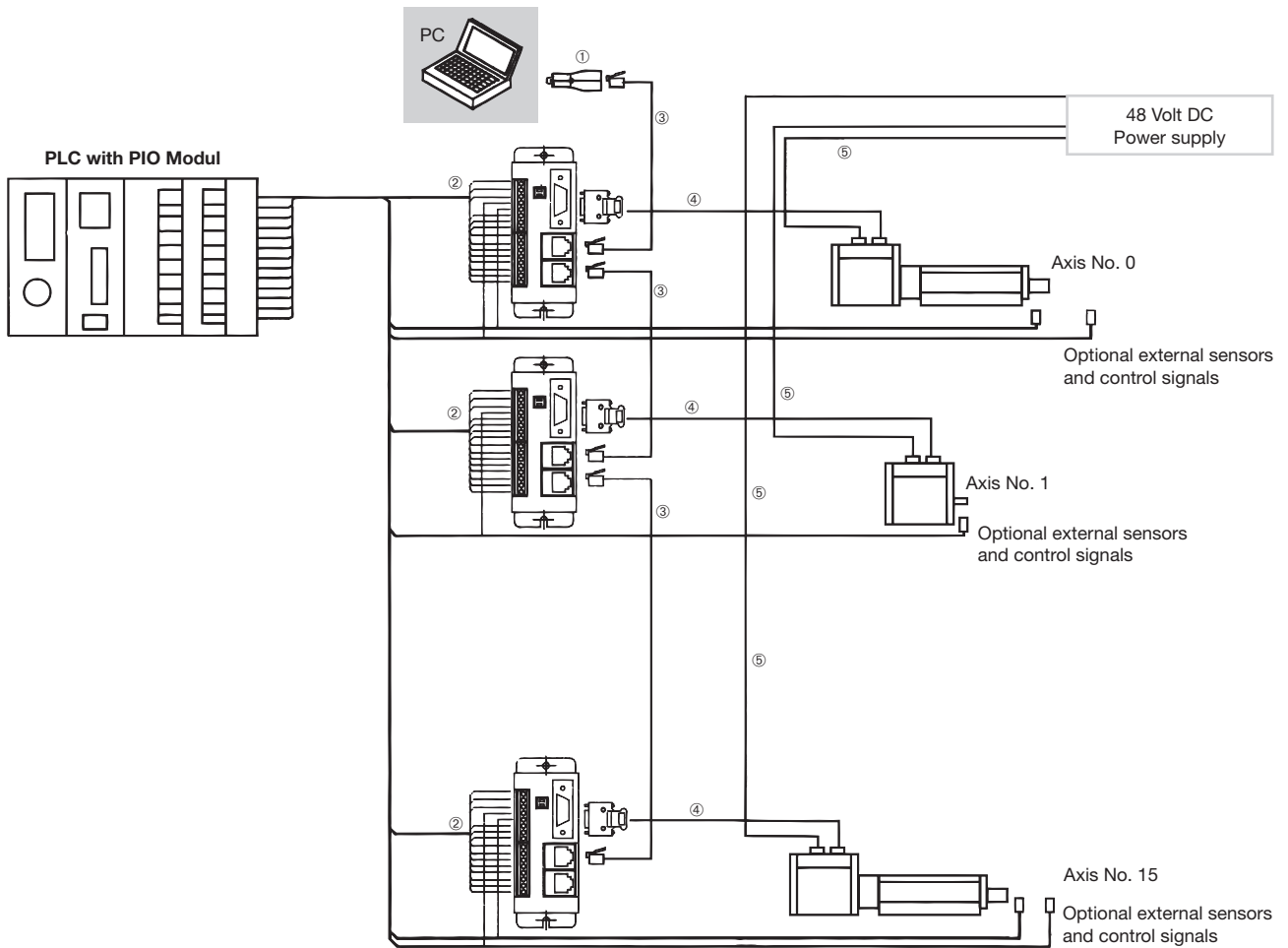
Single-axis control with serial RS485 interface



Accessories and cables		
①	Serial bus converter RS232 to RS485 or USB to RS485	TBG001-001 TBG001-002
②	Command cable (SIO)	TCC002-024-***-R
③	Power cable	TCC001-007-***-R

*** indicates cable length of 1, 2, 5, 10, 15 m cables available on request.

Multi-axis control with parallel IO's

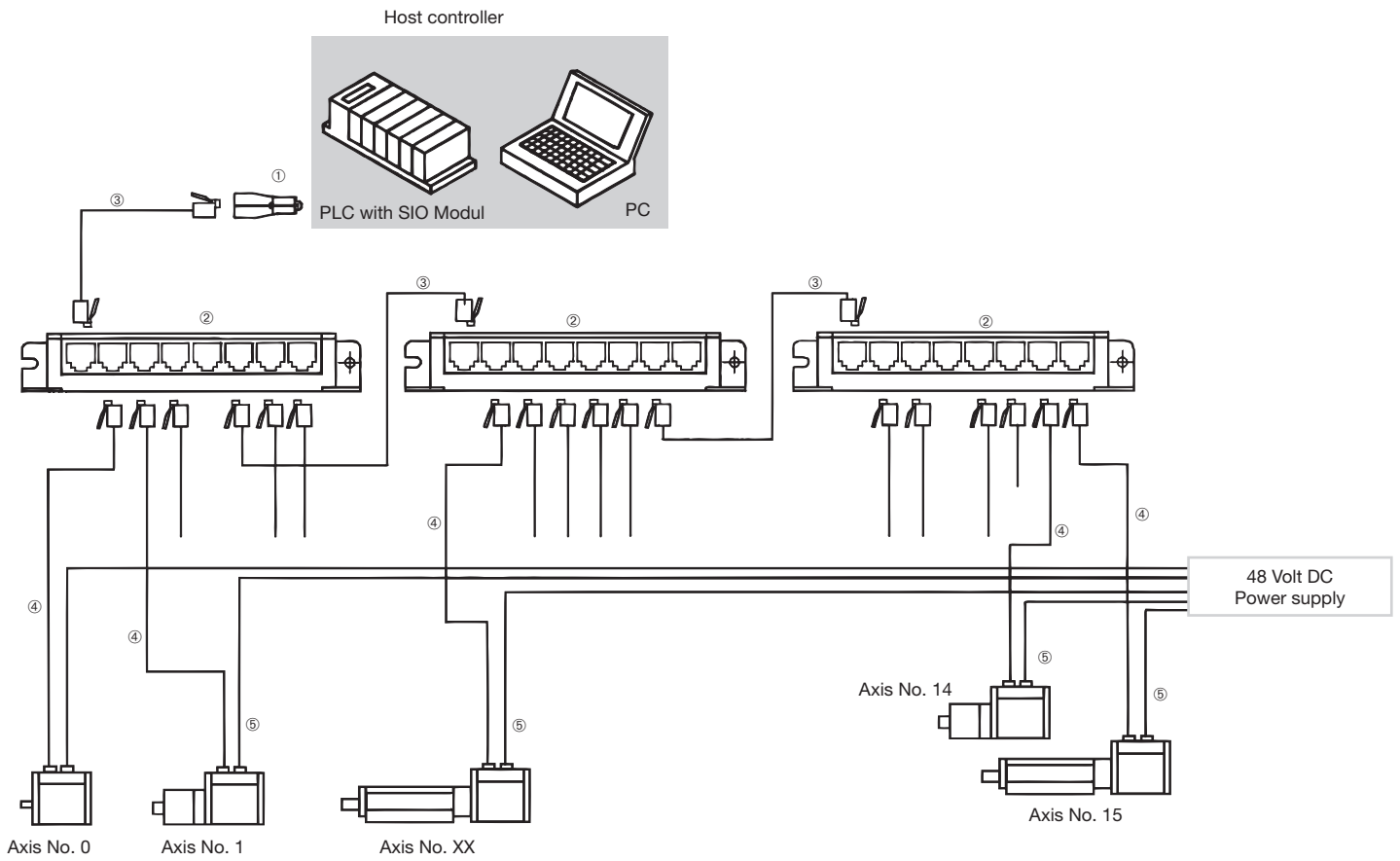


Accessories and cables		
①	Serial bus converter RS232 to RS485 or USB to RS485	TBG001-001 TBG001-002
②	Chaining terminal	TBG002-003
③	Command cable (SIO)	TCC002-001-***-R
④	Command cable (SIO/PIO)	TCC002-020-***-R
⑤	Power cable	TCC001-007-***-R

*** indicates cable length of 1, 2, 5, 10, 15 m cables available on request.

System configuration – diagrams

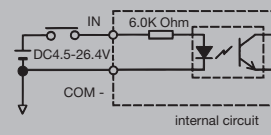
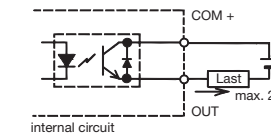
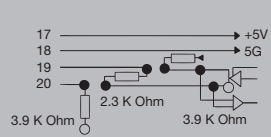
Multi-axis control with serial RS485 interface



Accessories and cables		
①	Serial bus converter RS232 to RS485 or USB to RS485	TBG001-001 TBG001-002
②	Chaining terminal (SIO)	TBG002-004
③	Command cable (SIO)	TCC002-001-***-R
④	Command cable (SIO)	TCC002-024-***-R
⑤	Power cable	TCC001-007-***-R

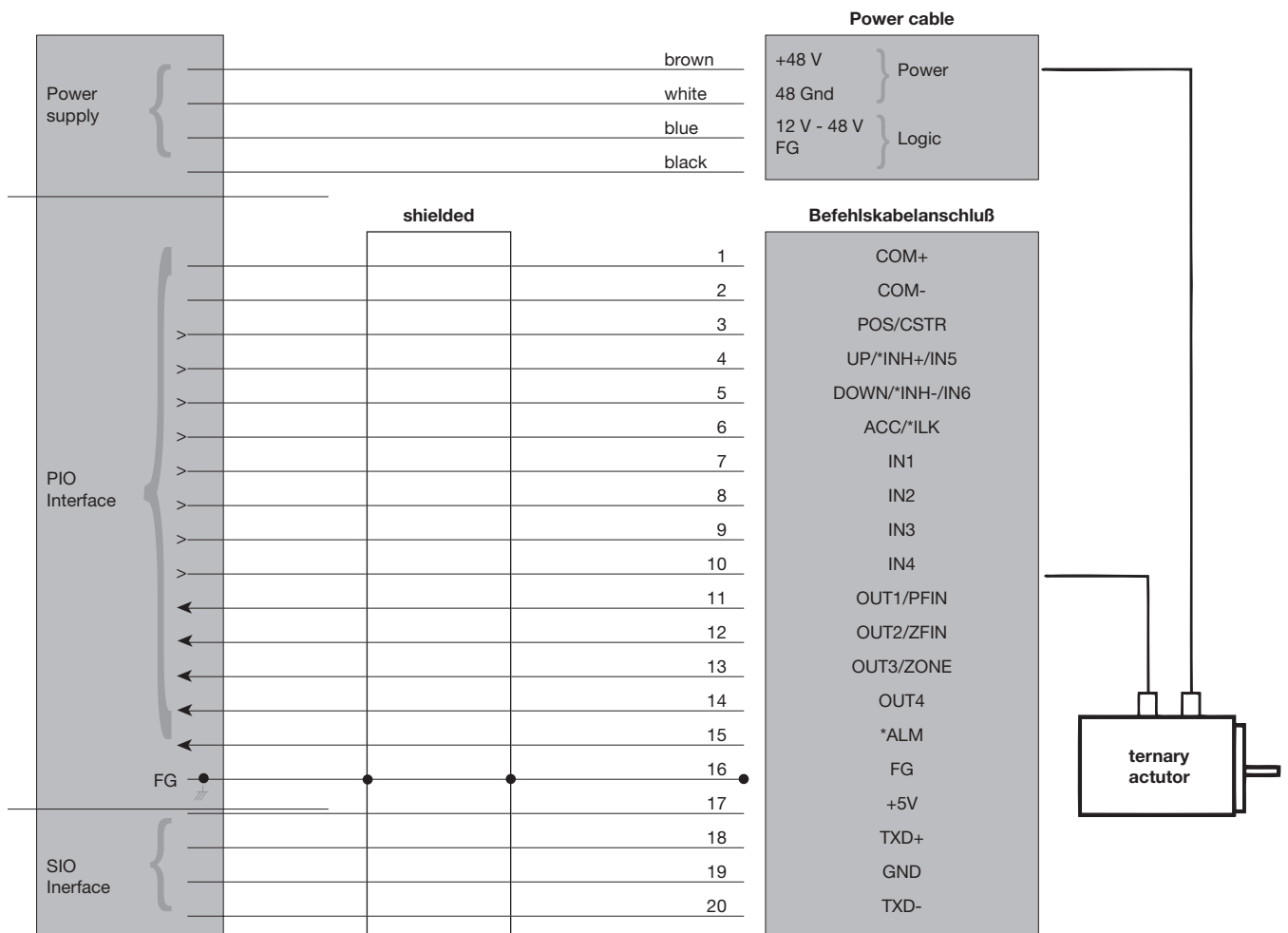
*** indicates cable length of 1, 2, 5, 10, 15 m cables available on request.

Control interface

Signal Type	PIN No.	Symbol	Function	Interface circuit source type PIO
Power	1	COM +	Logic power + for PIO interface	
	2	COM -	Logic power - for PIO interface	
Input	3	POS/CSTR	Position teaching mode/start trigger	
	4	UP/*INH+/IN5	Count up for teaching/inhibit signal+/Position No. selection	
	5	DOWN/*INH-/IN6	Count down for teaching/inhibit signal-/Position No. selection	
	6	ACC/*ILK	Acceleration teaching mode/Interlock signal	
	7 - 10	INn	Position No. selection	
Output	11	OUT1/PFIN	Position indicator1/position completed	
	12	OUT2/ZFIN	Position indicator2/Homing completed	
	13	OUT3/ZONE	Position indicator3/Zone signal	
	14	OUT4	Position indicator4/no connection	
	15	*ALM	Alarm signal	
GND	16	FG	Frame ground	
Power	17	+5V	Logic Power for SIO interface	
E/A	18	TXD +	RS485 signal +	
GND	19	GND	Logic GND for SIO interface	
E/A	20	TXD -	RS485 signal -	

* Active low signal

Wiring diagram



Any queries?

Have you any special questions regarding our products and services? Visit our homepage www.w-m-c.de.

