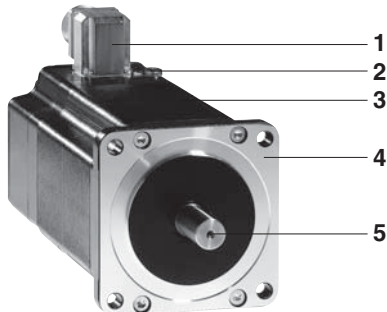


BRS 26•

Product offer



The 2-phase stepper motors from Schneider Electric Motion are extremely robust, maintenance-free motors. They carry out precise step-by-step movements that are controlled by a stepper motor drive. A stepper motor drive system consists of a stepper motor and the matching stepper motor drive. Maximum performance can only be obtained if motor and electronics are perfectly tuned to each other.

The 2-phase stepper motors can be operated at very high resolutions depending on the stepper motor drive.

Options such as rotation monitoring and holding brake as well as robust, low-play planetary gears extend the application options.

Special features

Strong

The optimised internal geometry of the motor ensures a high power density;

Flexible

With a flexible modular system and modern variant management, a wide variety of motor types can be manufactured and delivered in a very short time.

Structure

- (1) Motor connection, here a version with an angular connector
- (2) Additional terminal for protective conductor
- (3) Housing, with black protective coating
- (4) Axial flange with four mounting points as per DIN 42918
- (5) Smooth shaft end as per DIN 42918

Product quotation

Motor type		BRS 264	BRS 266	BRS 268
Max. torque M_{max}	Nm	0,40	0,85 ... 0,87	1,30 ... 1,40
Holding torque M_H	Nm	0,45	1,00	1,50 ... 1,60
Number of steps $z^{1)}$		200 / 400		
Step angle $\alpha^{1)}$	°	1,8 / 0,9		

¹⁾ With suitable control

Technical data								
Motor type		BRS 264		BRS 266			BRS 268	
Winding		5●●●●A	7●●●●D	7●●●●D	5●●●●A	3●●●●D	5●●●●A	3●●●●D
Max. supply voltage U_{max}	V_{AC}	24						
Nominal voltage DC bus U_N	V_{DC}	35						
Nominal torque M_N	Nm	0.40	0.40	0.85	0.87	0.85	1.30	1.40
Holding torque M_H	Nm	0.45	0.45	1.00	1.00	1.00	1.50	1.60
Rotor inertia J_R	kgcm ²	0.09	0.09	0.22	0.22	0.22	0.38	0.38
Steps per revolution z		200 / 400						
Step angle α	°	1.8 / 0.9						
Systematic angular tolerance $\Delta\alpha_s$ ¹⁾	'	±3						
Max. starting frequency full step f_{Aom}	kHz	1.8	1.7	1.35	1.5	1.6	1.1	1.2
Max. starting frequency half step f_{Aom}	kHz	3.4	3.2	2.6	2.9	3	2.1	2.1
Phase current I_W	A_{rms}	2.1	1	1	2.1	3	2.1	3
Winding resistance R_W	Ω	1	4.75	6.7	1.4	0.8	2	1.1
Rate-of-current rise time constant τ	ms	3.2	3.2	5.0	5.0	5.0	5.5	5.5
Number of connection wires		4	8	8	4	8	4	8
Weight m ²⁾	kg	0.5	0.5	0.7	0.7	0.7	1.05	1.05
Shaft load ³⁾								
• Max. radial force 1st shaft end ⁴⁾	N	24					50	
• Max. radial force 2nd shaft end (optional) ⁵⁾	N	25 / 40						
• Max. axial force pull	N	100						
• Max. axial force compression	N	8.4						
• Nominal bearing life L_{10h} ⁶⁾	h	20000						

1) Measured at 200 / 400 steps/revolution, unit: minutes of arc

2) Weight of the motor version with braided wires

3) Conditions for shaft load: speed of rotation 600 1/min, 100% ED at nominal torque, ambient temperature 40 °C (storage temperature ≈ 80 °C)

4) Point of attack of radial force: in the middle of the shaft end

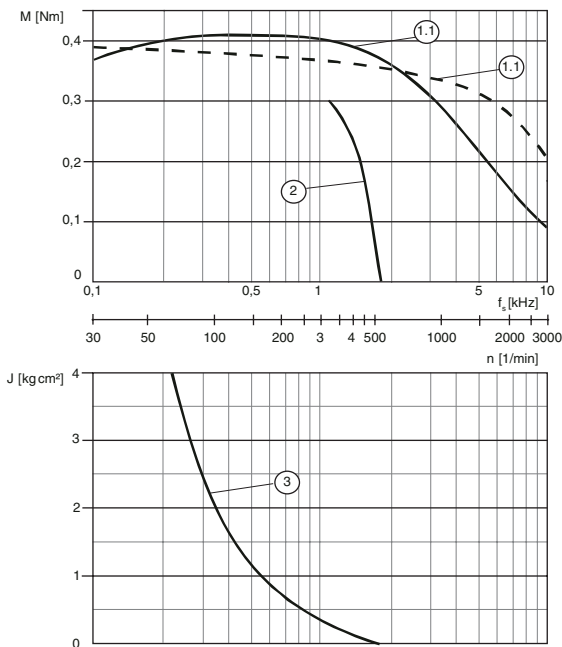
5) Point of attack of radial force: in the middle of the shaft end; 1st value: Motors with terminal boxes, connectors or encoder; 2nd value: Motors with braided wires

6) Operating hours at a failure probability of 10%

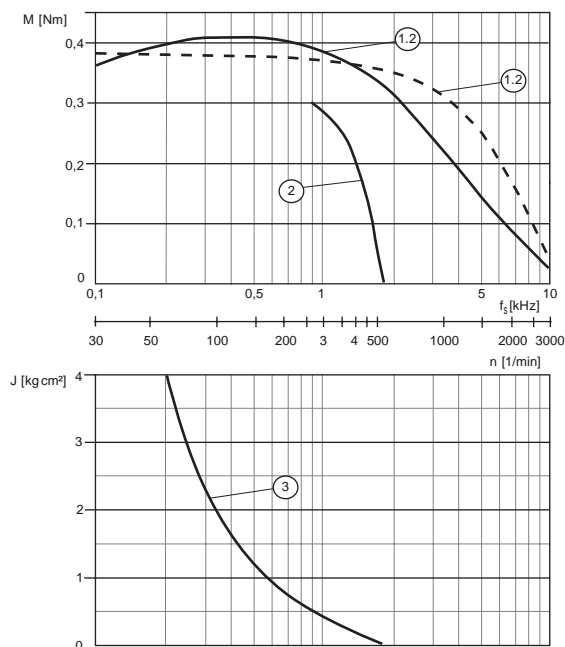
Environmental conditions		
Ambient temperature	°C	-25 ... +40
Installation height without power reduction	m a. MSL	1000
Transport and storage temperature	°C	-25 ... +70
Relative humidity	%	5 ... 85; no condensation permissible
Vibration severity in operation as per DIN EN 60034-14		A
Max. vibration load	m/s ²	20
Degree of protection as per DIN EN 60034-5		
• Total except shaft bushing		IP 41
• Shaft bushing		IP 41
• Terminal box / Connector version		IP 56
Heat class as per EN 60034-1		155 (F)
Shaft wobble and axial precision		DIN EN 50 347 (IEC 60072-1)
Max. rotary acceleration	Wheel/s ²	200000

Characteristic curves

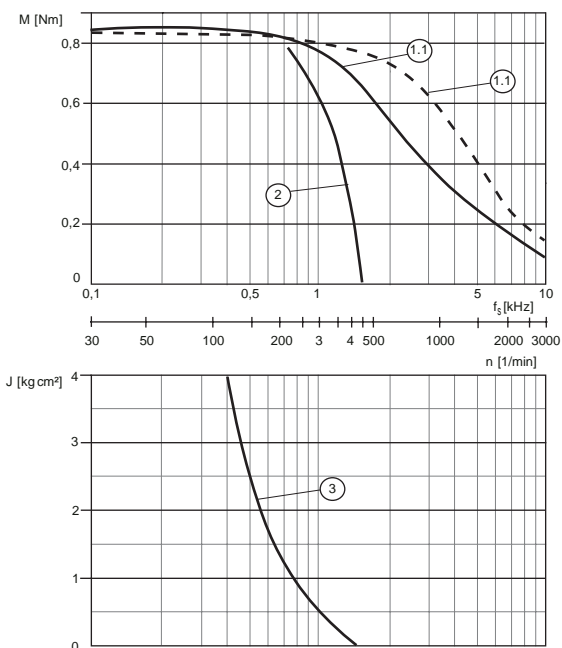
BRS 264 5●●●●A



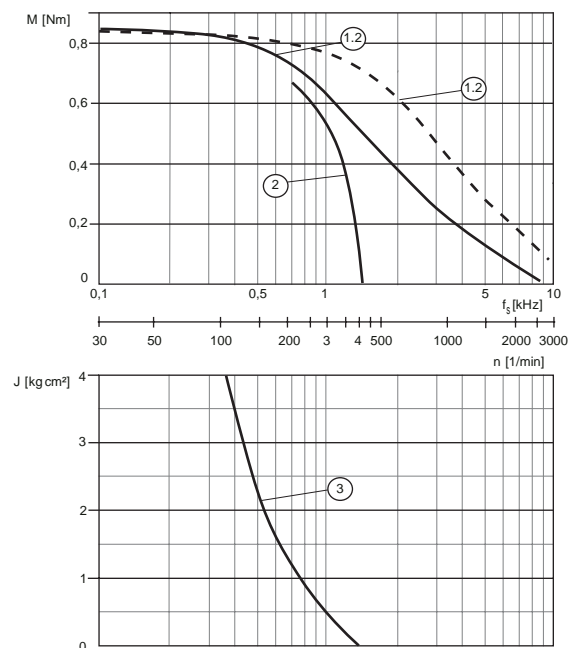
BRS 264 7●●●●D



BRS 266 5●●●●A



BRS 266 7●●●●D

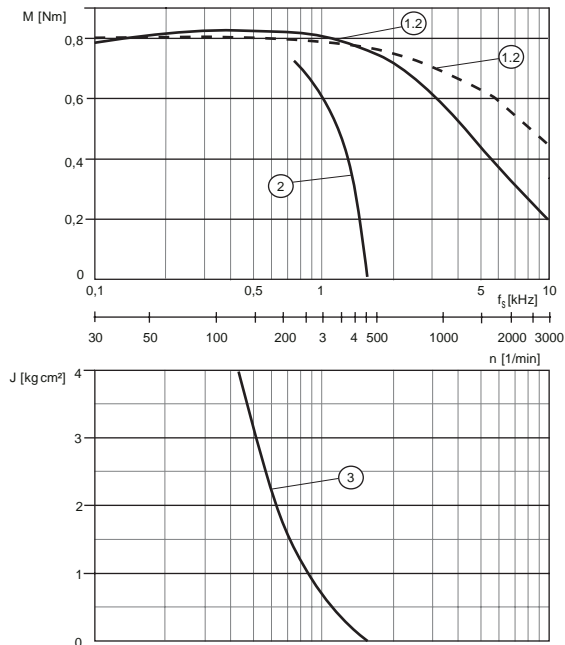


- (1.1) Pull-out torque at $U_N = 35 V_{DC}$ and $I_W = 2.1 A$
- (1.2) Pull-out torque at $U_N = 35 V_{DC}$ and $I_W' = 1.4 A$
(The characteristic curve was measured with a bipolar parallel connection and the calculated current: $I_W' = I_W \cdot \sqrt{2}$, I_W' - Current setting on controller)
- (2) Start limit torque
- (3) Maximum load inertia

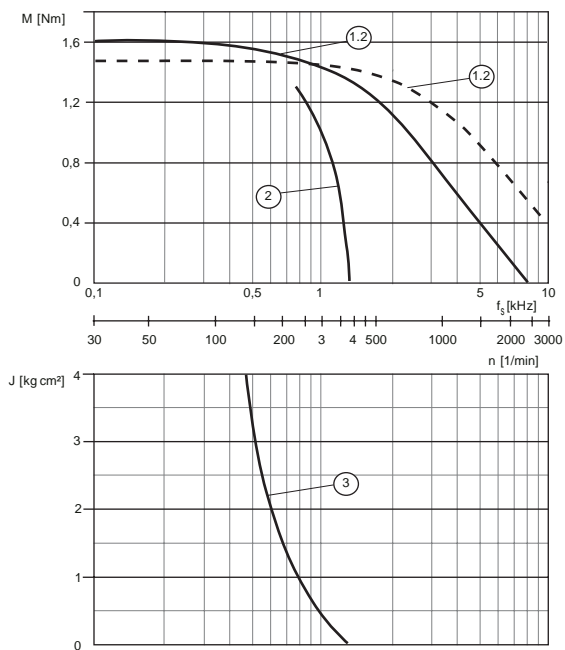
—: Measured at full step (200 steps per revolution)
- - -: Measured at half step (400 steps per revolution)

Characteristic curves

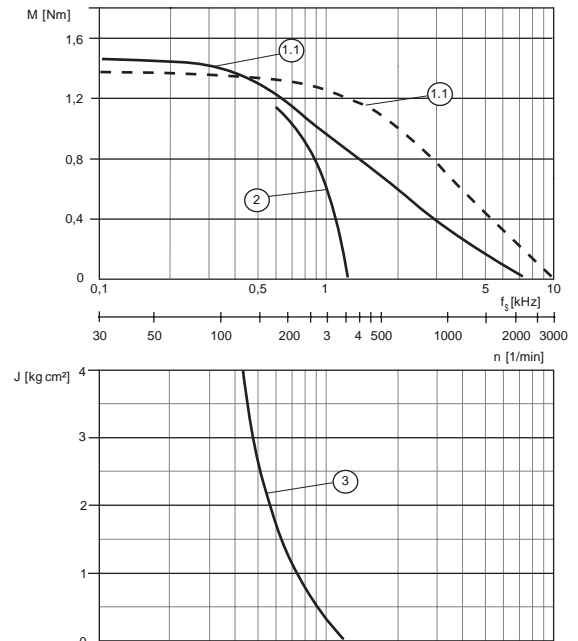
BRS 266 3•••••D



BRS 268 3•••••D



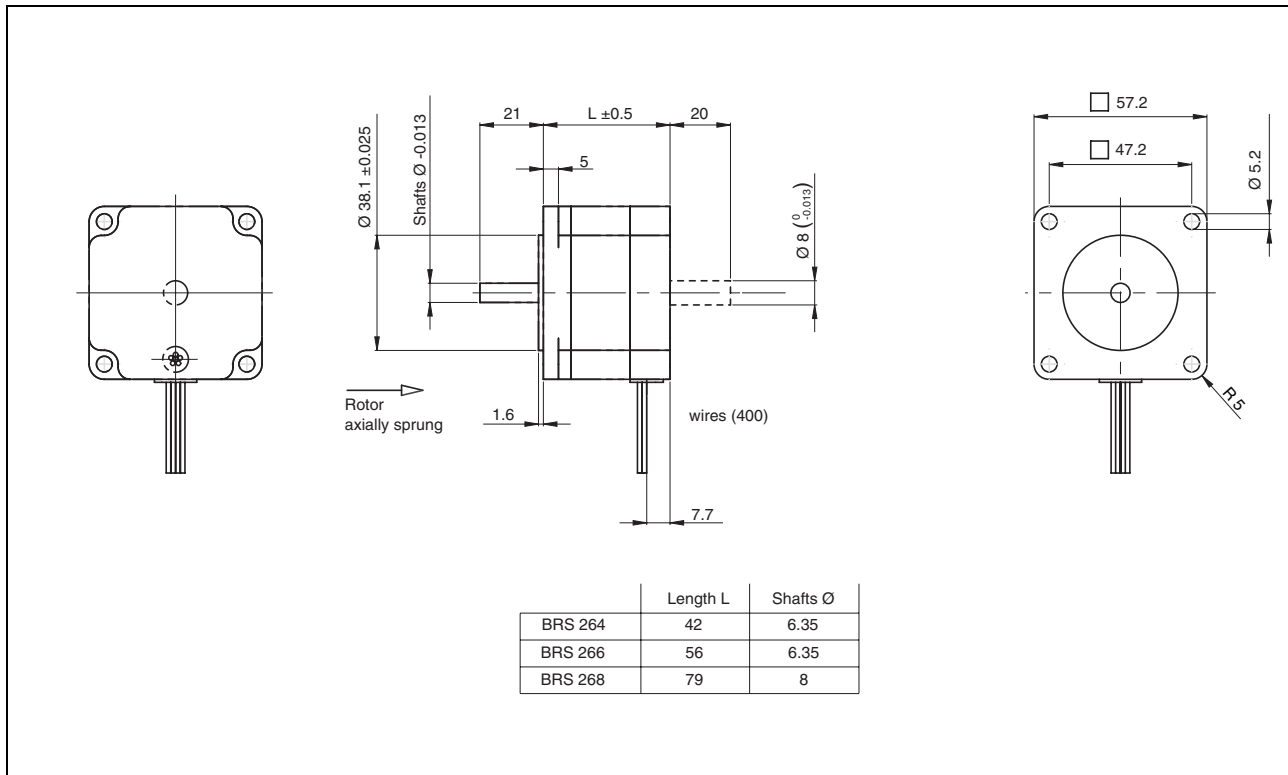
BRS 268 5•••••A



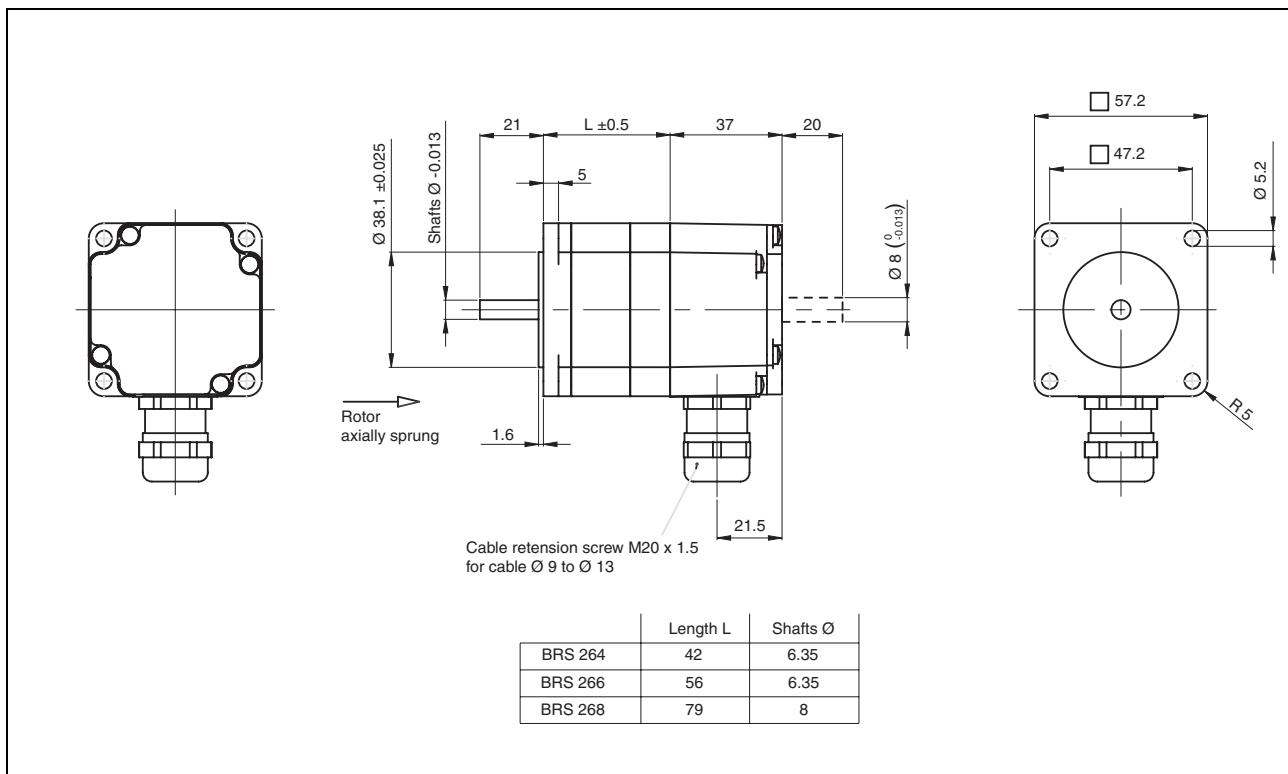
- (1.1) Pull-out torque at $U_N = 35 V_{DC}$ and $I_W = 2.1 A$
- (1.2) Pull-out torque at $U_N = 35 V_{DC}$ and $I_W' = 4.2 A$
(The characteristic curve was measured with a bipolar parallel connection and the calculated current: $I_W' = I_W \cdot \sqrt{2}$, I_W' - Current setting on controller)
- (2) Start limit torque
- (3) Maximum load inertia

- : Measured at full step (200 steps per revolution)
- - -: Measured at half step (400 steps per revolution)

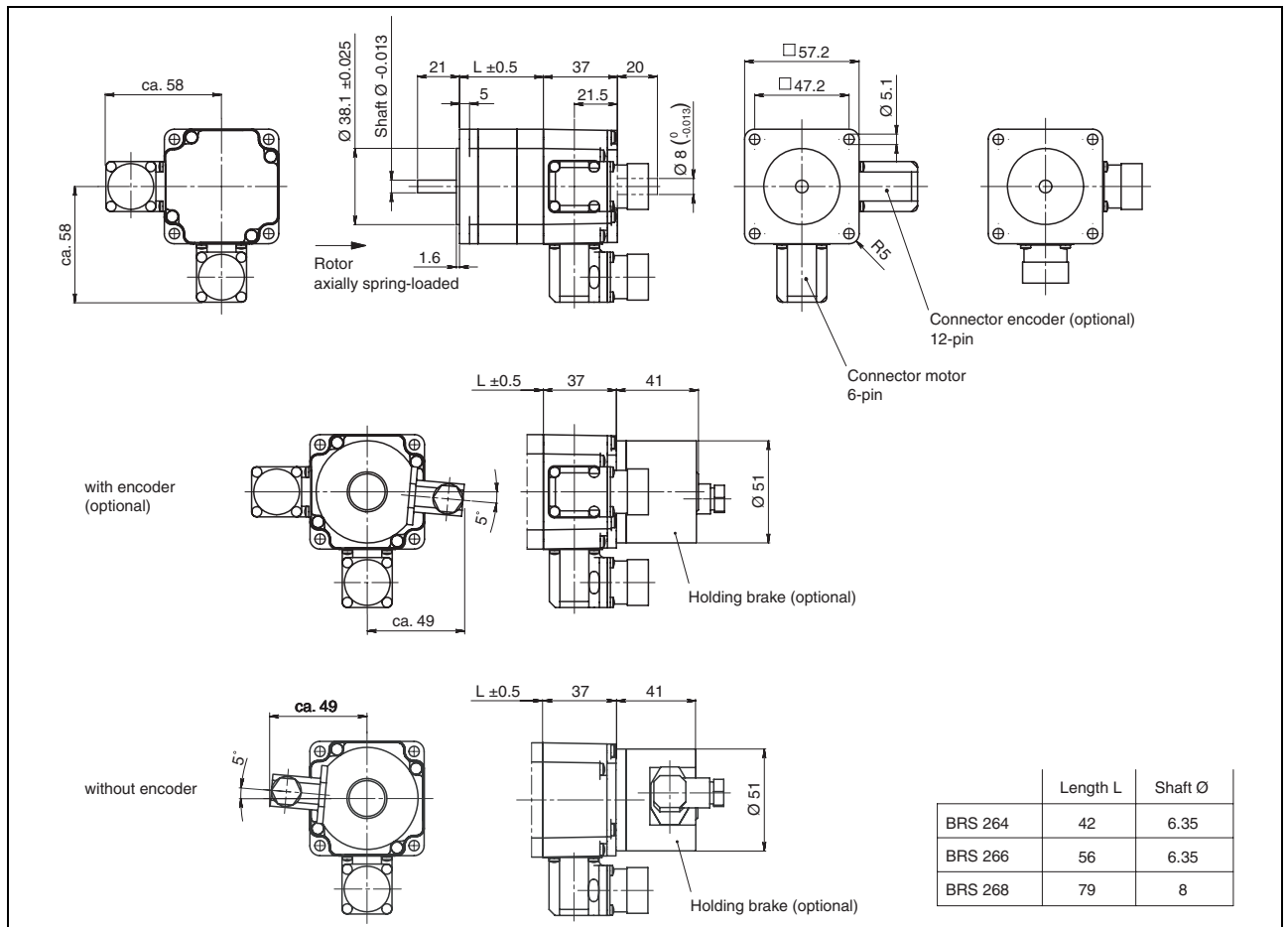
Dimensional drawings



2-phase stepper motor BRS 26• in braided wire version

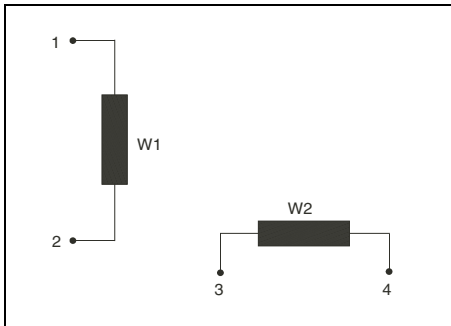


2-phase stepper motor BRS 26• in terminal box version



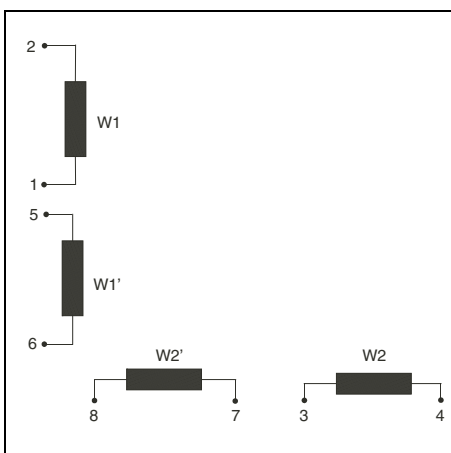
2-phase stepper motor BRS 26• in connector version

Motor connection



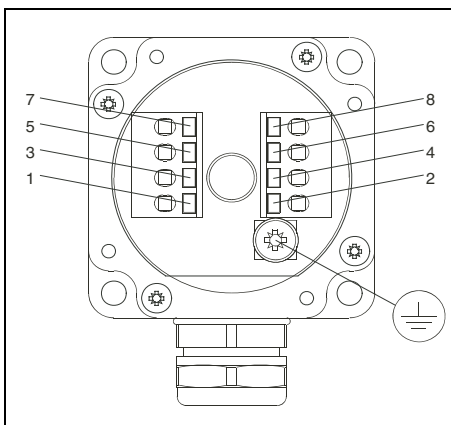
Motor connection in braided wire version with four connection wires

Designation	Motor wire colour as per DIN IEC 757	Motor wire colour
1	BR	brown
2	BR/WH	brown and white
3	RD	red
4	RD/WH	red and white



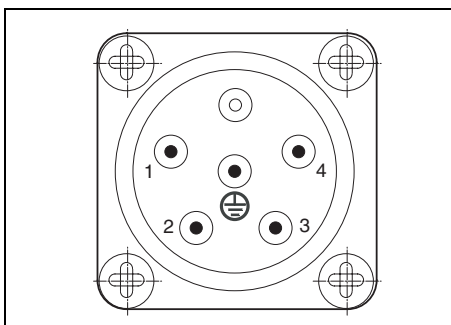
Motor connection in braided wire version with eight connection wires

Designation	Motor wire colour as per DIN IEC 757	Motor wire colour
1	BR	brown
2	BR/WH	brown and white
3	RD	red
4	RD/WH	red and white
5	OR	orange
6	OR/WH	orange and white
7	YE	yellow
8	YE/WH	yellow and white



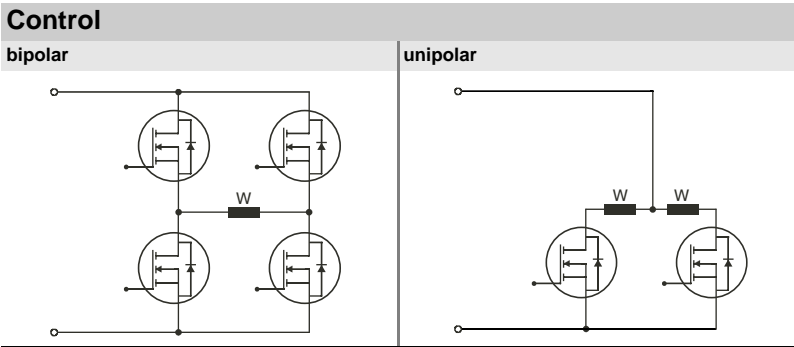
Motor connection in terminal box version

Designation	Wire colour as per DIN IEC 757	Wire colour
1	BR	brown
2	BR/WH	brown and white
3	RD	red
4	RD/WH	red and white
5	OR	orange
6	OR/WH	orange and white
7	YE	yellow
8	YE/WH	yellow and white



Motor connection in connector version

Designation	Wire colour as per DIN IEC 757	Wire colour
1	BR	brown
2	BR/WH	brown and white
3	RD	red
4	RD/WH	red and white



Type code											
Example:	BRS	2	6	4	3	0	3	0	A	D	A
Product family Brushless motors S = Stepper motor	BRS	2	6	4	3	0	3	0	A	D	A
Number of pole pairs 2	BRS	2	6	4	3	0	3	0	A	D	A
Size (flange) 6 = 57.2 mm	BRS	2	6	4	3	0	3	0	A	D	A
Length 4 = 42 mm 6 = 56 mm 8 = 79 mm	BRS	2	6	4	3	0	3	0	A	D	A
Winding 3; 5; 7	BRS	2	6	4	3	0	3	0	A	D	A
Shaft designfront 0 = Smooth shaft 6.35 mm 1 = Smooth shaft 8 mm S = Customer specific	BRS	2	6	4	3	0	3	0	A	D	A
Centring collar 3 = 38 mm	BRS	2	6	4	3	0	3	0	A	D	A
Position capture 0 = Without encoder 2 = With encoder (200 Increments/resolution)	BRS	2	6	4	3	0	3	0	A	D	A
Holding brake ¹⁾ A = Without brake F = With brake	BRS	2	6	4	3	0	3	0	A	D	A
Connection type A = 4 wires / Braided wire version D = 8 wires / Braided wire version B = 8 wires / Terminal box version C = 4 wires / Connector version	BRS	2	6	4	3	0	3	0	A	D	A
Second shaft A = Without second shaft B = With second shaft	BRS	2	6	4	3	0	3	0	A	D	A

¹⁾ not possible in connection with terminal box version

Possible motor types

BRS 264 5●●●●A●

BRS 264 7●●●●D●

BRS 266 3●●●●D●

BRS 266 5●●●●A●

BRS 266 7●●●●D●

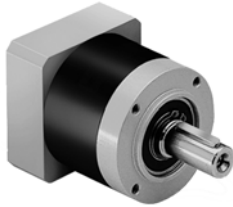
BRS 268 3●●●●D●

BRS 268 5●●●●A●

Accessories

GBX planetary gearboxes

Presentation



In many cases the axis controller requires the use of a planetary gearbox for adjustment of speed of rotation and torque; the accuracy required by the application must be maintained.

Schneider Electric has chosen to use GBX gearboxes (made by Neugart) with the BRS range of stepper motors. These gearboxes are lubricated for life and are designed for applications which are not susceptible to mechanical backlash. The fact that their use in combination with BRS stepper motors has been fully verified and that they are easily assembled, ensures simple, risk-free operation.

Available in two sizes (GBX 40, GBX 60), the planetary gearboxes are offered in ten reduction ratios (3:1...25:1), see table below.

The values for the continuous torque and the peak torque at standstill which are available at the output shaft, are calculated by multiplying the motor characteristics with the gear ratio and the efficiency of the gearing (0.96 or 0.94 depending on the gear ratio).

The following table shows the optimum combination of BRS stepper motor and GBX planetary gearbox.

BRS stepper motors/GBX gearbox combinations

BRS 26•	Reduction ratio								
	3:1	5:1	8:1	9:1	12:1	15:1	16:1	20:1	25:1
BRS 264	GBX 40	GBX 40	GBX 40	GBX 40	GBX 40	GBX 40	GBX 40	GBX 40	GBX 40
BRS 266	GBX 40	GBX 40	GBX 40	GBX 40	GBX 40	GBX 40	GBX 40	GBX 40	GBX 40
BRS 268	GBX 60	GBX 60	GBX 60	GBX 60	GBX 60	GBX 60	GBX 60	GBX 60	GBX 60

Characteristics of GBX gearboxes

			GBX 40	GBX 60
Version	Planetary gearbox with straight teeth			
Backlash	3:1 ... 8:1	arcmin	< 24	< 16
	9:1 ... 25:1		< 28	< 20
Torsional rigidity	3:1 ... 8:1	Nm/ arcmin	1	2.3
	9:1 ... 25:1		1.1	2.5
Noise level ¹⁾			58	58
Casing	Steel, black surface			
Shaft material	C 45			
Shaft output dust and dump protection	IP 54			
Lubrication	Lifetime lubrication			
Average service life ²⁾		h	30000	
Mounting position	Any position			
Operating temperature			°C -25 ... +90	
Efficiency	3:1 ... 8:1		0.96	
	9:1 ... 25:1		0.94	
Maximum permitted radial force ^{2) 3)}	L _{10h} = 10000 h	N	200	500
	L _{10h} = 30000 h	N	160	340
Maximum permitted axial force ²⁾	L _{10h} = 10000 h	N	200	600
	L _{10h} = 30000 h	N	160	450
Moment of inertia of gearbox	3:1	kg cm ²	0.031	0.135
	5:1	kg cm ²	0.019	0.078
	8:1	kg cm ²	0.017	0.065
	9:1	kg cm ²	0.03	0.131
	12:1	kg cm ²	0.029	0.127
	15:1	kg cm ²	0.023	0.077
	16:1	kg cm ²	0.022	0.088
	20:1	kg cm ²	0.019	0.075
	25:1	kg cm ²	0.019	0.075

Characteristics of GBX gearboxes

		GBX 40		GBX 60	
Continuous output torque ²⁾	3:1	Nm	11	28	
	5:1	Nm	14	40	
	8:1	Nm	6	18	
	9:1	Nm	16.5	44	
	12:1	Nm	20	44	
	15:1	Nm	18	44	
	16:1	Nm	20	44	
	20:1	Nm	20	44	
	25:1	Nm	18	40	
Maximum output torque ²⁾	3:1	Nm	17.6	45	
	5:1	Nm	22	61	
	8:1	Nm	10	29	
	9:1	Nm	26	70	
	12:1	Nm	32	70	
	15:1	Nm	29	70	
	16:1	Nm	32	70	
	20:1	Nm	32	70	
	25:1	Nm	29	64	

¹⁾ Value measured at a distance of 1 m, at no-load for a servo motor speed of 3000 rpm and a reduction ratio of 5:1.

²⁾ Values given for an output shaft speed of 100 rpm in S1 mode (cyclic ratio = 1) on electrical machines for an ambient temperature of 30 °C.

³⁾ Force applied at mid-distance from the output shaft.

Order data

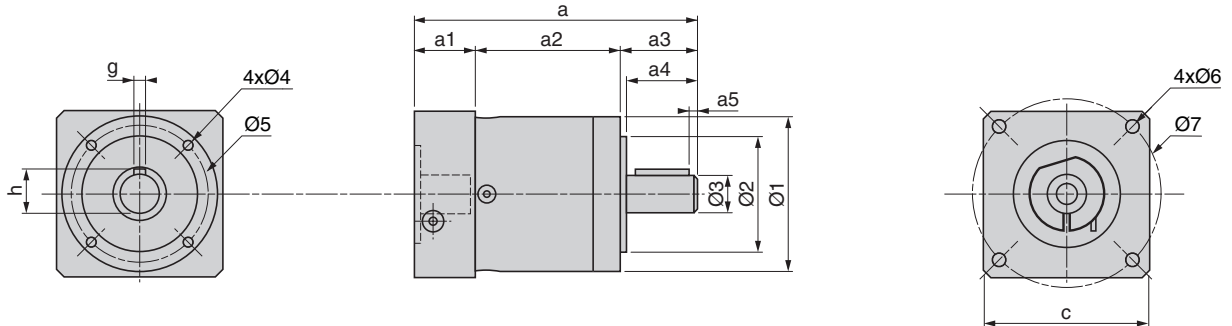
Size	Reduction ratio	Reference	Weight kg
GBX 40	3:1, 5:1, 8:1, 9:1, 12:1, 15:1, 16:1, 20:1 and 25:1	GBX 040 ●●● ●●● ●S	0.350
GBX 60	3:1, 5:1, 8:1, 9:1, 12:1, 15:1, 16:1, 20:1 and 25:1	GBX 060 ●●● ●●● ●S	0.900

Order code GBX planetary gearboxes

		GBX	●●●	●●●	●●●	●	S
Size	Diameter of the housing	40 mm	040				
		60 mm	060				
Reduction ratio	3:1			003			
	5:1			005			
	8:1			008			
	9:1			009			
	12:1			012			
	15:1			015			
	16:1			016			
	20:1			020			
Associated BRS stepper motor	Type	BRS26●			060		
	Model	BRS 268				1	
		BRS 264, BRS 266					5
BRS stepper motor adaptation							S

Dimensional drawings GBX planetary gearboxes

Mounting at motor side



GBX	c	a	a1	a2	a3	a4	a5	h	g	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7
040 003 ... 008	60	89.5	24.5	39	26	23	2.5	11.2	3	40	26 h7	10 h7	M4 x 6	34	M5 x12	66,7
040 009 ... 025	60	102.5	24.5	52	26	23	2.5	11.2	3	40	26 h7	10 h7	M4 x 6	34	M5 x12	66,7
060 003 ... 008	60	106.5	24.5	47	35	30	2.5	16	5	60	40 h7	14 h7	M5 x 8	52	M5 x12	66,7
060 009 ... 025	60	119	24.5	59.5	35	30	2.5	16	5	60	40 h7	14 h7	M5 x 8	52	M5 x12	66,7

Mounting recommendations

Special tools are not required for mounting the GBX planetary gear. Note the following requirements:

- 1 Clean grease off contact areas and seals.
- 2 If possible, mount the motor in a vertical position. Fit motor into gearing.
- 3 Motor flange must be in contact with gearing flange. Tighten screws crosswise.
- 4 Tighten clamping ring with torque spanner.

More information can be found in the instructions supplied with the product.

