E/809000/*
Electromechanical actuator

- Ø32 ... 100 mm
- Robust construction
- Cylinder based on ISO 15552
- Maintenance-free
- Reliable performance
- Long life
- Wide range of accessories



Technical features

Function:
Actuator with ball screw; with or without servo motor

Standard:
Based on ISO 15552

Cylinder diameters:
32, 40, 50, 63, 80, 100 mm

Strokes:
Available 100 ... 1500 mm
(short strokes < 100 mm on request)

Speed:
max. 0,2 ... 1,6 m/s

Forces F_{max}:
2,5 ... 30,4 kN (thrust force)

Motor data Voltage:
400 VAC

Rated current:
0,7 ... 9 A

Power:
0,16 ... 3,3 kW

Output power:
0,75 ... 4,0 kW

Duty cycle:
100 %

Operating temperature:
0 ... 80°C (32 ... 176°F)

IP Protection rates:
Actuator: IP40
IP65 only on request.
(only with motor)

Standard Materials:
Barrel: Anodized aluminum
End covers: Anodized aluminum
Piston rod: Stainless steel (austenitic)
Piston rod seals: PUR

Technical data

Cylinder Ø (mm)	32		40			50			63			80				100			
Spindle diameter (mm)	12		16			20			25			32				40			
Spindle pitch (mm)	5	10	5	10	16	5	10	20	5	10	25	5	10	20	32	5	10	20	40
Axial clearance Actuator (mm)	+ 0,02		+ 0,04			+ 0,04			+ 0,04			+ 0,04				+ 0,04	+ 0,07		
Dynamic force C (N)	5000	5100	10100	7900		13100	9700	6800	14600	14500	7400	23400	26500	16800	11400	25400	44600	33800	22800
F max axial (N)	3000	2520	5200	4100	4200	8000	5500	3800	10150	10100	4750	20000	20000	11950	7750	24600	30400	22200	14450
Momentum torque max (Drive shaft) (Nm)	2,4	4,0	4,2	6,5	10,8	6,4	8,8	12,2	8,1	16,1	19,0	16,0	31,9	38,1	39,6	19,6	48,4	70,7	92,2
Orderstroke (mm)	100 ... 800		100 ... 800			100 ... 1000			100 ... 1200			100 ... 1500				100 ... 1500			
Available velocity with standard Norgren servo motor (m/s)	0,25	0,5	0,25	0,5	0,8	0,25	0,5	1,0	0,25	0,5	1,25	0,2	0,5	0,9	1,5	0,2	0,4	0,8	1,6
Max permissible velocity (m/s)	0,6	1,3	0,5	1,0	1,6	0,4	0,8	1,5	0,3	0,6	1,5	0,2	0,5	0,9	1,5	0,2	0,4	0,8	1,6
Max permissible rpm (1/min)	7690	7630	6470	6120	6000	4590	4660	4570	3610	3670	3640	2840	2830	2830	2820	2280	2380	2380	2370
Acceleration max (m/s²)	10																		
Max. angle of rotation at the piston rod (°)	0,65		0,6			0,5			0,4			0,3				0,25			

Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH

List of Content:

General rules	3
Cylinder Variants	4
Sizing rules and formulas	7
Permissible axial forces Fmax	8
Permissible speeds	10
Life time information	11
Example for the selection of an electromechanical actuator	12
Basic dimensions cylinders	14
Weights, moving mass, inertia	15
Mountings and accessorie	28

Electric Motion Family

(Drive versions in the purple frame are shown in this data sheet)

Image	Drive type	Description	Data sheet
	Electromechanical	E-Series Sliding or roller guide Linear axis with simple external guide in combination with tooth belt, spindle or rack and pinion drive.	en 21.1.100
	Electromechanical	D-Series Roller or rail guide Linear axis with double internal guide in combination with tooth belt, spindle or rack and pinion drive	en 21.1.110
	Electromechanical	Q-Series Roller or rail guide Linear axis with single internal guide in combination with tooth belt or spindle drive	en 21.1.120
	Electromechanical	L-Series Roller or rail guide Linear axis with single internal guide in combination with a tooth belt drive	en 21.1.130
	Pneumatic	M/146000, M/146100, M/146200, LINTRA®PLUS Rodless cylinder with and without magnetic piston, double-acting	en 1.6.009
	Electromechanical	E/809000/* Electromechanical cylinder	en 21.6.300
	Pneumatic	PRA/802000/M, RA/802000/M, RA/8000, RA/8000/M ISOLine™ 15552 Cylinder, double-acting	en 1.5.220
	Electromechanical	2-Axis Systems XY, XZ, YZ systems with roller or rail guide and tooth belt drive.	en 1.20.500

Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH

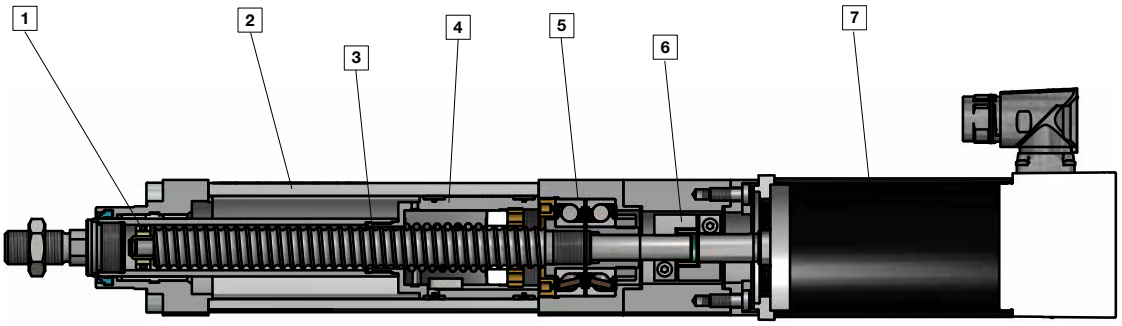
The ELION electric actuator is a combination of a ball screw driven actuator and an electric servo motor. Therefore, it must be ensured that the system design, installation, commissioning/start-up and maintenance are carried out by personnel who have the necessary training and competence. They must read this safety information and I&M guide carefully.

Operating conditions

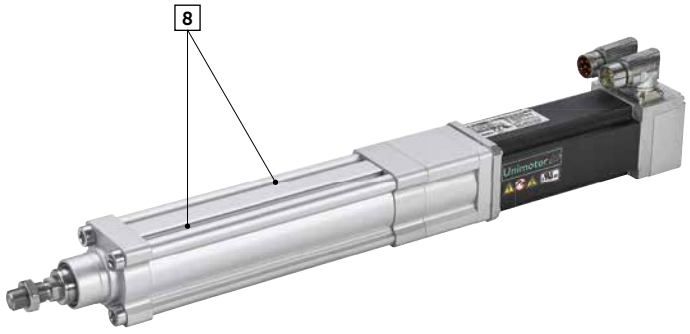
The actuator can perform multiple linear positioning tasks. To prevent damage of the electromechanical actuator, lateral forces on the piston rod must be avoided, e.g. by the implementation of external guiding. Impact load on the piston rod and housing must also be avoided to prevent damage on the ball screw nut and bearings.

Actuator sizing

Ball screw drive actuators like the ELION are complex mechanical systems transferring the rotational movement of an electric motor into a linear motion. Please be advised that the technical data presented on page 1 may vary for different applications. For exact sizing, please refer to page 7, use the online configurator or contact our technical service.



1	Piston rod bearing
2	Profile barrel
3	Spindle
4	Ball screw nut
5	Ball screw bearing
6	Coupling
7	Motor (not included in the delivery)
8	Switch groove

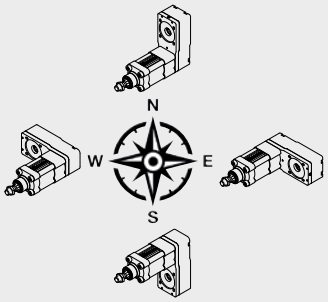




Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH

Standard cylinder variants (IP40)

E/809★★★/★★★/★★★/★★★★/★★★

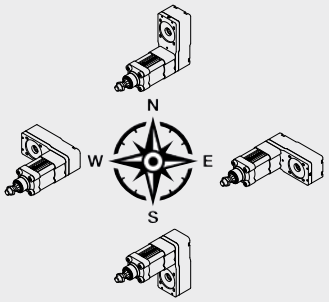
Size	Ball Screw	Variants				Motor Kit		Flange/Motor					Stroke (mm)	Piston rod extension (mm)
		Standard	Piston rod bellows	Piston rod extension	Internal thread					Resolver	Absolute (multi turn)	Holding brake, resolver	Holding brake, absolute (multi turn)	
Sub. 1	Sub. 2	Sub. 3					Sub. 4		Sub. 5	Sub. 6				Sub. 7	Sub. 8
Ø32	032	M	G	U	X	*Actuator only, no coupling, no housing*	A	No motor	X	X				100 ... 800	1 ... 200 *(Use only for Variant "U" otherwise leave empty)*
						Actuator with coupling and housing for customer individual motor	B	No motor		07, 08, 09, *					
	12x5	05				*Axial kit*	D	No motor, flange □ 40; ØN=30; ØM=46	X	1					
								No motor, flange □ 55; ØN=40; ØM=63		2					
						Parallel kit - "North"	N	No motor, flange □ 40; ØN=30; ØM=46	X	1					
								No motor, flange □ 55; ØN=40; ØM=63		2					
						Parallel kit - "East"	E	No motor, flange □ 40; ØN=30; ØM=46	X	1					
								No motor, flange □ 55; ØN=40; ØM=63		2					
	12x10	10				*Parallel kit - "South"*	S	No motor, flange □ 40; ØN=30; ØM=46	X	1					
								No motor, flange □ 55; ØN=40; ØM=63		2					
						Parallel kit - "West"	W	No motor, flange □ 40; ØN=30; ØM=46	X	1					
								No motor, flange □ 55; ØN=40; ØM=63		2					
Ø40	040	M	G	U	X	*Actuator only, no coupling, no housing*	A	No motor	X	X				100 ... 800	1 ... 200 *(Use only for Variant "U" otherwise leave empty)*
						Actuator with coupling and housing for customer individual motor	B			09, 12, 14, *					
	16x5	05				*Axial kit*	D	No motor, flange □ 55; ØN=40; ØM=63	X	1					
								No motor, flange □ 67; ØN=60; ØM=75		2					
						Parallel kit - "North"	N	No motor, flange □ 55; ØN=40; ØM=63	X	1					
								No motor, flange □ 67; ØN=60; ØM=75		2					
	16x10	10				*Parallel kit - "East"*	E	No motor, flange □ 55; ØN=40; ØM=63	X	1					
								No motor, flange □ 67; ØN=60; ØM=75		2					
						Parallel kit - "South"	S	No motor, flange □ 55; ØN=40; ØM=63	X	1					
								No motor, flange □ 67; ØN=60; ØM=75		2					
	16x16	16				*Parallel kit - "West"*	W	No motor, flange □ 55; ØN=40; ØM=63	X	1					
								No motor, flange □ 67; ØN=60; ØM=75		2					

* For more versions please contact the technical service.

Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH

Standard cylinder variants (IP40)

E/809★★★/★★★/★★★/★★★★/★★★

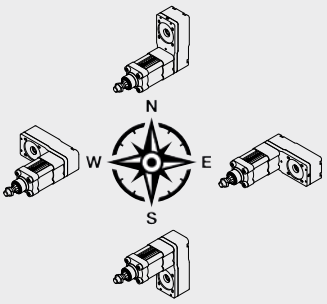
Size		Ball Screw		Variants				Motor Kit		Flange/Motor					Stroke (mm)	Piston rod extension (mm)
				Standard	Piston rod bellows	Piston rod extension	Internal thread					Resolver	Absolute (multi turn)	Holding brake, resolver	Holding brake, absolute (multi turn)		
Sub. 1		Sub. 2		Sub. 3					Sub. 4			Sub. 5	Sub. 6			Sub. 7	Sub. 8
Ø50	050	*20x5*	05	M	G	U	X	*Actuator only, no coupling, no housing*	A	*No motor*		X	X			100 ... 1000	1 ... 250 *(Use only for Variant "U" otherwise leave empty)*
								Actuator with coupling and housing for customer individual motor	B			09, 12, 14, *				
								Axial kit	D	*No motor, flange □67; ØN=60; ØM=75*		X	1			
		20x10	10					*Parallel kit - "North"*	N	*No motor, flange □67; ØN=60; ØM=75*		X	1			
								Parallel kit - "East"	E	*No motor, flange □67; ØN=60; ØM=75*		X	1			
								Parallel kit - "South"	S	*No motor, flange □67; ØN=60; ØM=75*		X	1			
		20x20	20					*Parallel kit - "West"*	W	*No motor, flange □67; ØN=60; ØM=75*		X	1			
Ø63	063	*25x5*	05	M	G	U	X	*Actuator only, no coupling, no housing*	A	*No motor*		X	X			100 ... 1200	1 ... 300 *(Use only for Variant "U" otherwise leave empty)*
								Actuator with coupling and housing for customer individual motor	B			14, 18, 19, *				
								Axial kit	D	*No motor, flange □67; ØN=60; ØM=75*	X	1				
										No motor, flange □89; ØN=80; ØM=100		2				
		25x10	10					*Parallel kit - "North"*	N	*No motor, flange □67; ØN=60; ØM=75*	X	1				
										No motor, flange □89; ØN=80; ØM=100		2				
								Parallel kit - "East"	E	*No motor, flange □67; ØN=60; ØM=75*	X	1				
										No motor, flange □89; ØN=80; ØM=100		2				
								Parallel kit - "South"	S	*No motor, flange □67; ØN=60; ØM=75*	X	1				
										No motor, flange □89; ØN=80; ØM=100		2				
		25x25	25					*Parallel kit - "West"*	W	*No motor, flange □67; ØN=60; ØM=75*	X	1				
										No motor, flange □89; ØN=80; ØM=100		2				

* For more versions please contact the technical service.

Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH

Standard cylinder variants (IP40)

E/809★★★/★★★/★★★/★★★★/★★★

Size		Ball Screw		Variants				Motor Kit		Flange/Motor					Stroke (mm)	Piston rod extension (mm)
				Standard	Piston rod bellows	Piston rod extension	Internal thread					Resolver	Absolute (multi turn)	Holding brake, resolver	Holding brake, absolute (multi turn)		
	Sub. 1		Sub. 2	Sub. 3					Sub. 4		Sub. 5	Sub. 6				Sub. 7	Sub. 8
Ø80	080	*32x5*	05	M	G	U	X	*Actuator only, no coupling, no housing*	A	*No motor*	X	X				100 ... 1500	1 ... 350 *(Use only for Variant "U" otherwise leave empty)*
								Actuator with coupling and housing for customer individual motor	B			14, 18, 19, *				
								Axial kit	D	*No motor, flange □67; ØN=60; ØM=75*	X	1				
										No motor, flange □89; ØN=80; ØM=100		2				
								Parallel kit - "North"	N	*No motor, flange □67; ØN=60; ØM=75*	X	1				
										No motor, flange □89; ØN=80; ØM=100		2				
								Parallel kit - "East"	E	*No motor, flange □67; ØN=60; ØM=75*	X	1				
										No motor, flange □89; ØN=80; ØM=100		2				
		32x20	20					*Parallel kit - "South"*	S	*No motor, flange □67; ØN=60; ØM=75*	X	1				
										No motor, flange □89; ØN=80; ØM=100		2				
								Parallel kit - "West"	W	*No motor, flange □67; ØN=60; ØM=75*	X	1				
										No motor, flange □89; ØN=80; ØM=100		2				
Ø100	100	*40x5*	05	M	G	U	X	*Actuator only, no coupling, no housing*	A	*No motor*	X	X				100 ... 1500	1 ... 350 *(Use only for Variant "U" otherwise leave empty)*
								Actuator with coupling and housing for customer individual motor	B			19, 22, 24, *				
								Axial kit	D	*No motor, flange □89; ØN=80; ØM=100*	X	1				
										No motor, flange □115; ØN=110; ØM=130		2				
								Parallel kit - "North"	N	*No motor, flange □89; ØN=80; ØM=100*	X	1				
										No motor, flange □115; ØN=110; ØM=130		2				
								Parallel kit - "East"	E	*No motor, flange □89; ØN=80; ØM=100*	X	1				
										No motor, flange □115; ØN=110; ØM=130		2				
		40x20	20					*Parallel kit - "South"*	S	*No motor, flange □89; ØN=80; ØM=100*	X	1				
										No motor, flange □115; ØN=110; ØM=130		2				
								Parallel kit - "West"	W	*No motor, flange □89; ØN=80; ØM=100*	X	1				
										No motor, flange □115; ØN=110; ØM=130		2				

* For more versions please contact the technical service.

Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH

Sizing Rules and Formulas

1. Definition of the load cycle

The load cycle includes all movements of the actuator. For every step, the following values must be defined:

- Direction of the movement
- End position of the movement
- External load mass
- Friction coefficient of a possible external guiding
- Acceleration and deceleration
- Maximum velocity
- Constant external forces
- Possible pause times at the end of the movement

Due to the high positioning accuracy of the ELION actuators, the number of steps in one cycle is not limited.

2. Calculation of the forces acting on the actuator

For a basic selection of the actuator, the knowledge of the acting forces during the load cycle is essential. For each movement of the load, the total force must be calculated. The total force F_{tot} can be calculated as the sum the inertial force F_{I}, external friction forces F_{fr}, the gradient force F_{gr} caused by moving a mass against gravity and possible constant external forces $F_{const.}$

$$F_{\mathrm{tot}} = F_{\mathrm{I}} + F_{\mathrm{fr}} + F_{\mathrm{gr}} + F_{\mathrm{const}}$$

The forces can be calculated as follows:

$$F_{\mathrm{I}} = -\left(m_{\mathrm{mov,act}} + m_{\mathrm{load}}\right) \cdot a$$
$$F_{\mathrm{fr}} = -\mathrm{sign}(\Delta x) \cdot \mu \cdot \left|\cos(\varphi) \cdot \left(m_{\mathrm{mov,act}} + m_{\mathrm{load}}\right) \cdot g\right|$$
$$F_{\mathrm{gr}} = \sin(\varphi) \cdot \left(m_{\mathrm{mov,act}} + m_{\mathrm{load}}\right) \cdot g$$

a	Acceleration/deceleration	m/s²
mmov,act	Moving mass of the actuator	kg
mload	Load mass applied on actuator	kg
Δx	Stroke of each movement	m
j	Direction of the movement	°
μ	Friction coefficient	–
g	Gravitational acceleration	m/s²

3. Selection of the actuator

3.1 Safety stroke

Disregarding the initial set up, the actuator must not touch its mechanical end stops.
A safety stroke should be considered, respecting the application boundaries and environments.
We generally recommend a safety stroke of 20 mm per side for electric actuators.
The order stroke = working stroke + safety stroke of 2 x 20 mm.

3.2 Spindle pitch

The pitch of the driving spindle can be defined by the maximum velocity of the load cycle

$$v_{\mathrm{cycle}} \leq v_{\mathrm{max,actuator}}$$

The correlation between the maximum stroke length and the maximum velocity of the actuator must be considered as well as the different spindle pitch values d efining the maximum velocity.
Using the values for stroke length and velocity, the maximum force necessary during the load cycle can be compared to the maximum force applicable to the actuator. Here, the direction of movement has to be considered to prevent buckling of the cylinder rod and spindle.

$$F_{\mathrm{tot,max}} < F_{\mathrm{max,actuator}}$$

In general, side loads on the actuator should be avoided. If lateral forces appear, an external guiding system must be applied!

4. Selection of a motor

For each actuator, two motor sizes are available. The selection of the motor is based on the driving torque T and rotational speed rpm which have to be calculated for each step of the load cycle. All values calculated must be below the intermittent torque the motor can deliver.

$$T = F_{\mathrm{tot,step}} \cdot \frac{P_{\mathrm{spindle}}}{2\pi \cdot 0.85}$$

$$rpm = \frac{v_{\mathrm{max,step}}}{P_{\mathrm{spindle}}} \cdot 60000$$

T	Torque	Nm
rpm	Rotational speed	min⁻¹
$v_{max,step}$	Maximum velocity of each step	m/s
$P_{spindle}$	Spindle pitch	mm

To avoid overheating of the motor, the mean torque T_{rms} of the load cycle must be lower than the continuous torque.

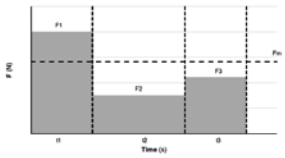
$$T_{\mathrm{rms}} = \sqrt{\sum\left(\frac{F_{\mathrm{tot,step}} \cdot P_{\mathrm{spindle}}}{2\pi \cdot 0.85}\right)^2 \cdot \frac{t_{\mathrm{step}}}{t_{\mathrm{tot}}}}$$

$$rpm_{\mathrm{rms}} = \sqrt{\sum\left(rpm_{\mathrm{step}}\right)^2 \cdot \frac{t_{\mathrm{step}}}{t_{\mathrm{tot}}}}$$

5. Estimation of expected life time

The estimated life time of the ball screw drive can be calculated according to DIN ISO 3408-5. Therefore, the mean velocity v_m and the mean force F_m must be calculated.

$$F_{\mathrm{m}} = \sqrt[3]{\sum_{j=1}^{n}\left(\left|F_{\mathrm{tot,step},j}^3\right| \cdot \frac{\left|v_{\mathrm{step},j}\right|}{v_{\mathrm{m}}} \cdot \frac{t_{\mathrm{step},j}}{t_{\mathrm{tot}}}\right)}$$



Then, the life time in revolutions is calculated from the dynamic force C of the ball screw nut and the mean force.

$$L = \left(\frac{C}{F_m}\right)^3 \cdot 10^6$$

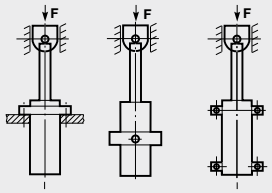
The life time L_{km} in km is then calculated with the spindle pitch P.

$$L_{\mathrm{km}} = L \cdot P \cdot 10^{-6}$$

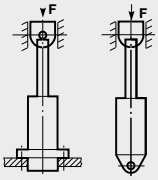
Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH

Cylinder variants
Permissible axial forces F_{max}

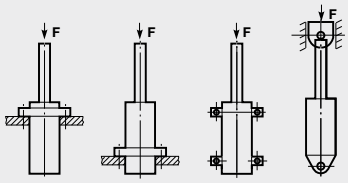
Case 1



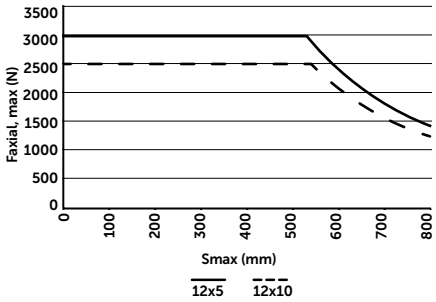
Case 2

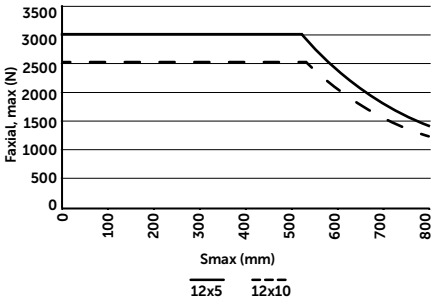


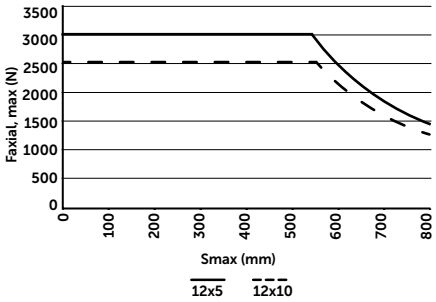
Case 3



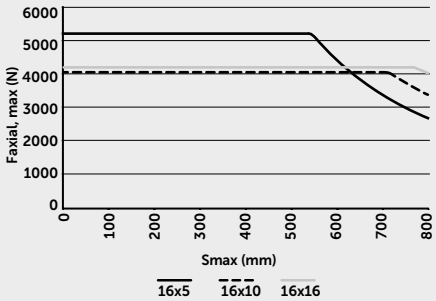
Ø32

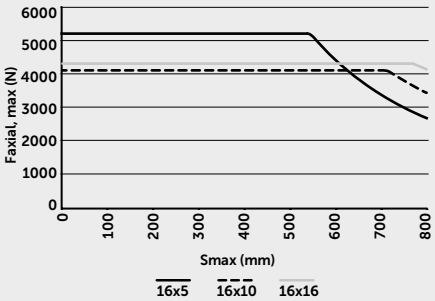


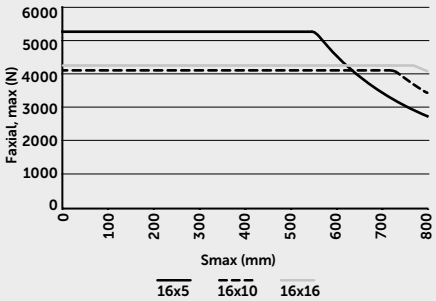




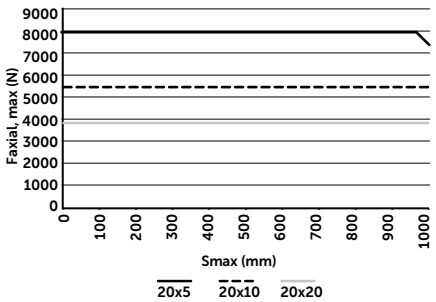
Ø40

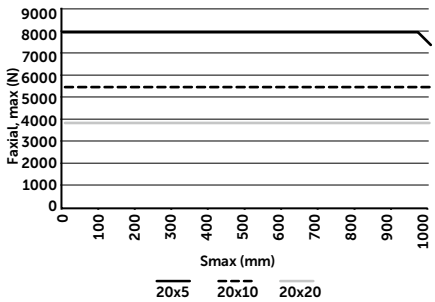


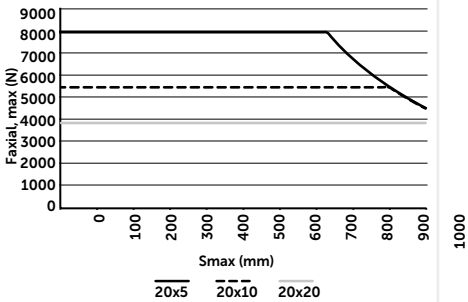




Ø50



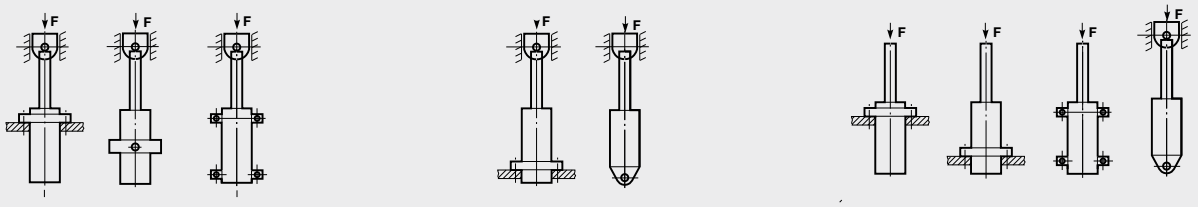




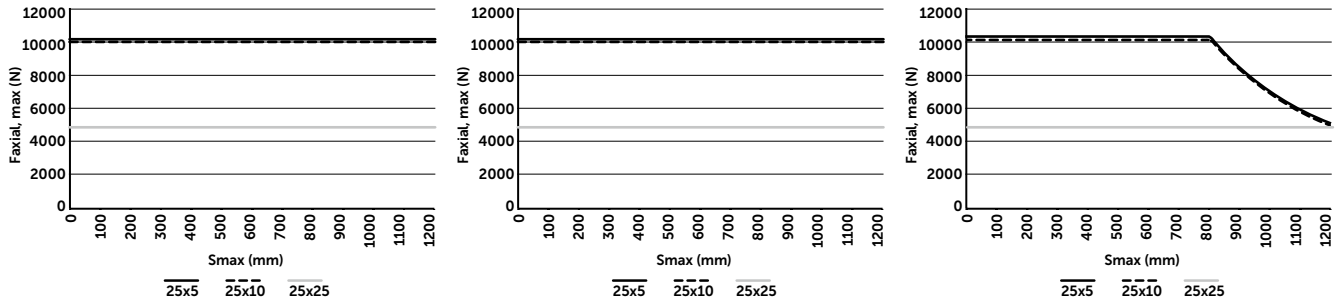
Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH

Cylinder variants
Permissible axial forces F_{max}

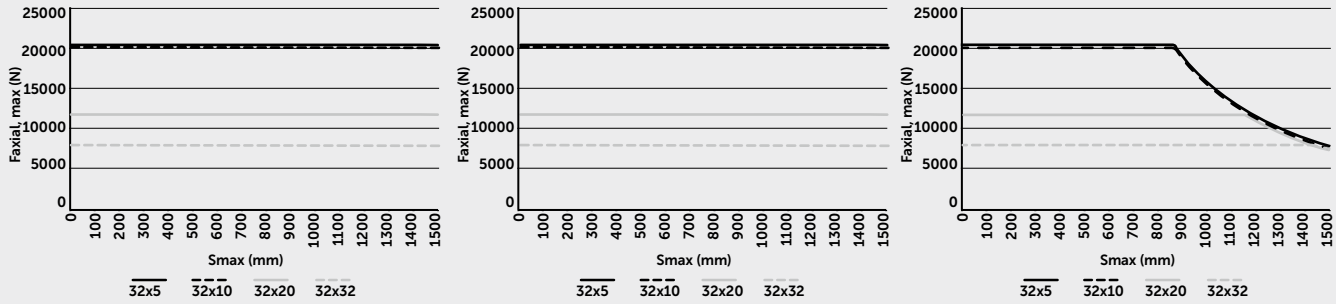
Case 1 | Case 2 | Case 3



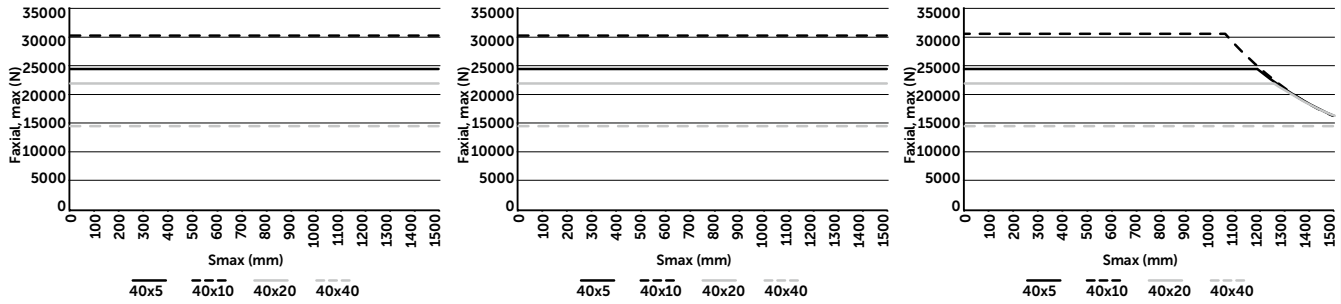
Ø63



Ø80



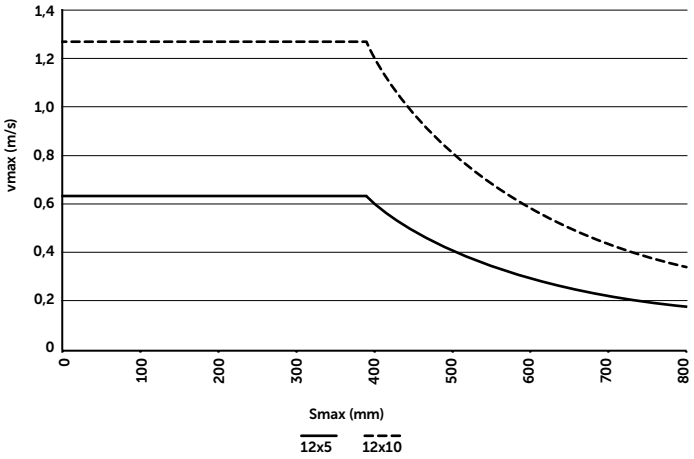
Ø100



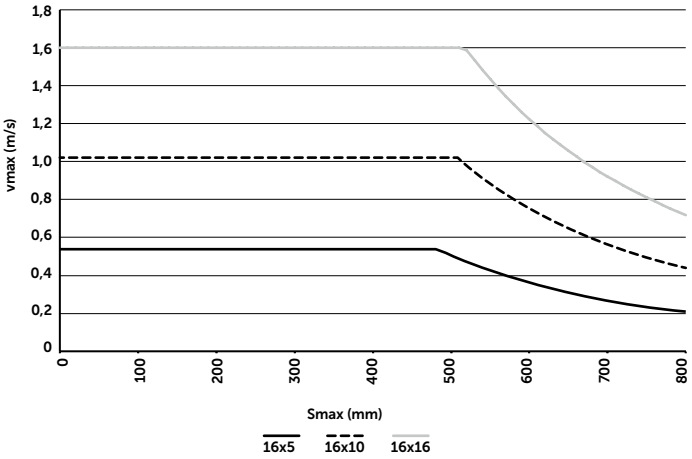
Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH

Permissible Speeds

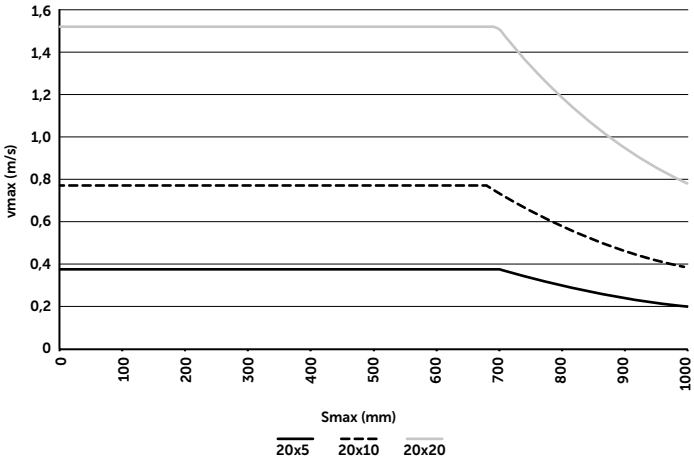
Ø32



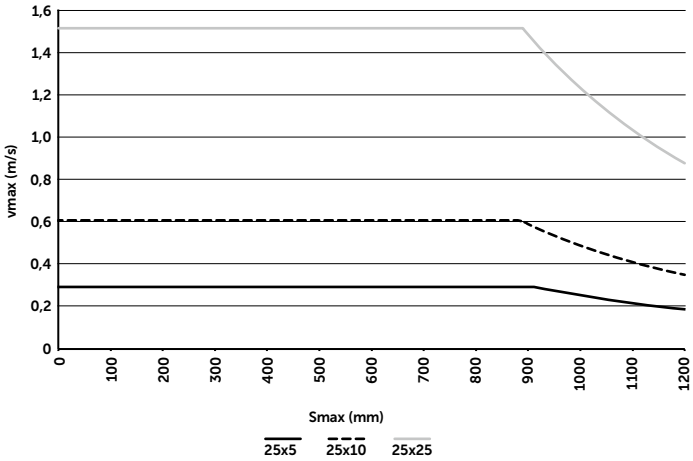
Ø40



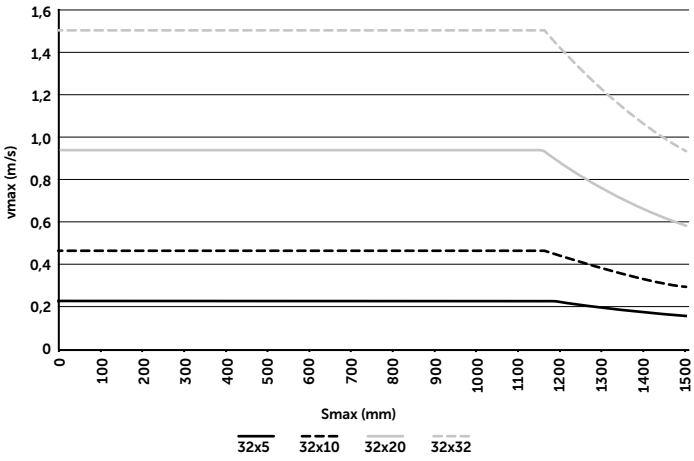
Ø50



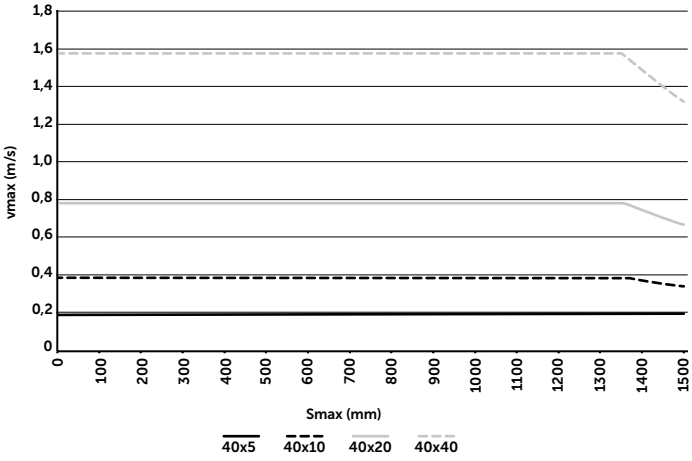
Ø63



Ø80



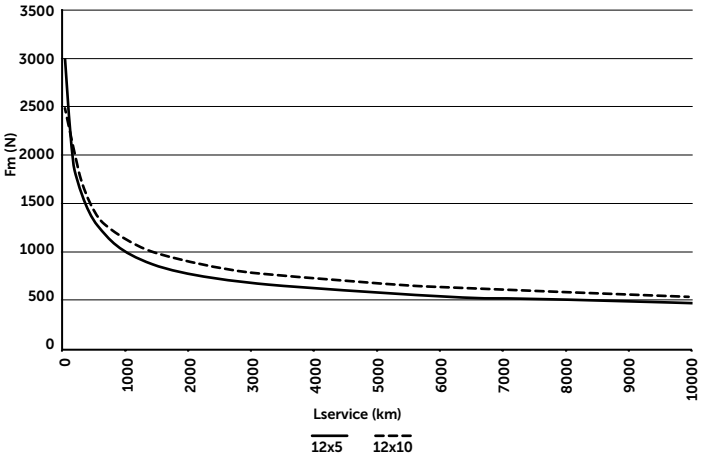
Ø100



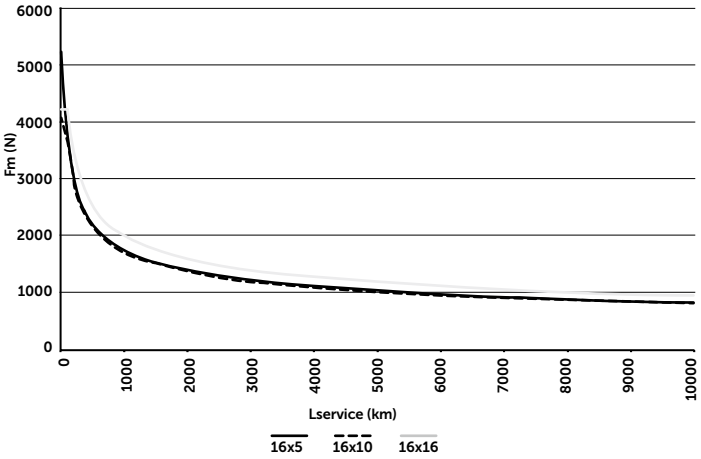
Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH

Force Life Time

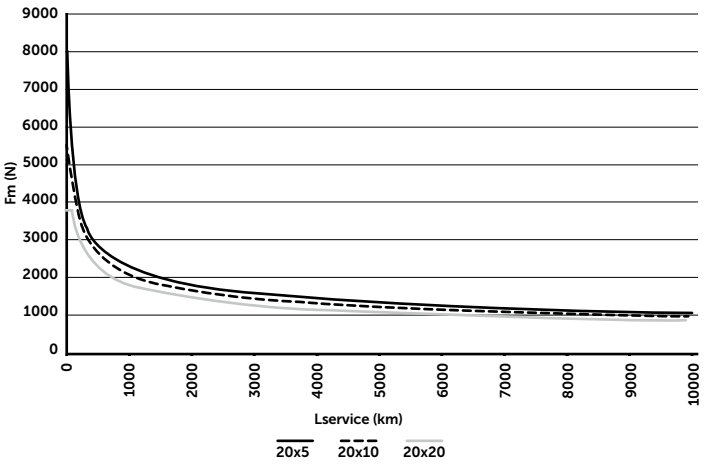
Ø32



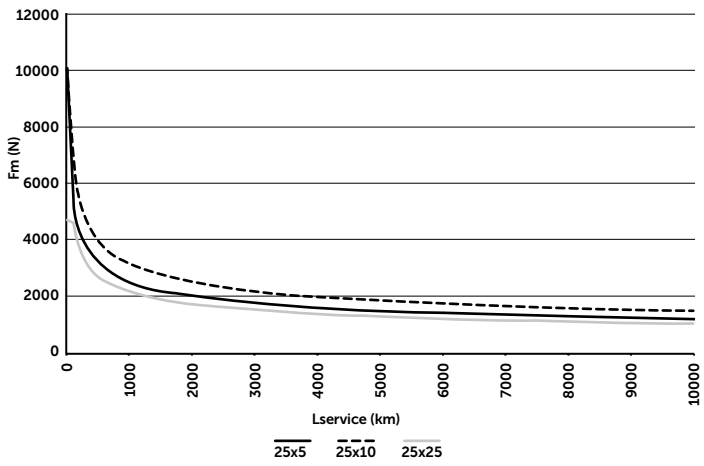
Ø40



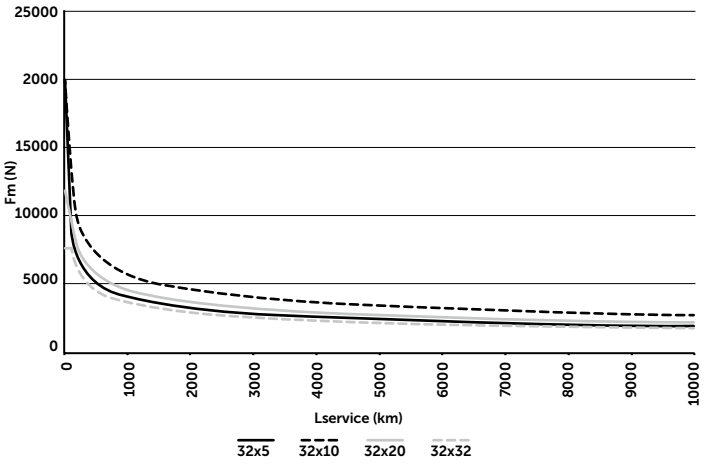
Ø50



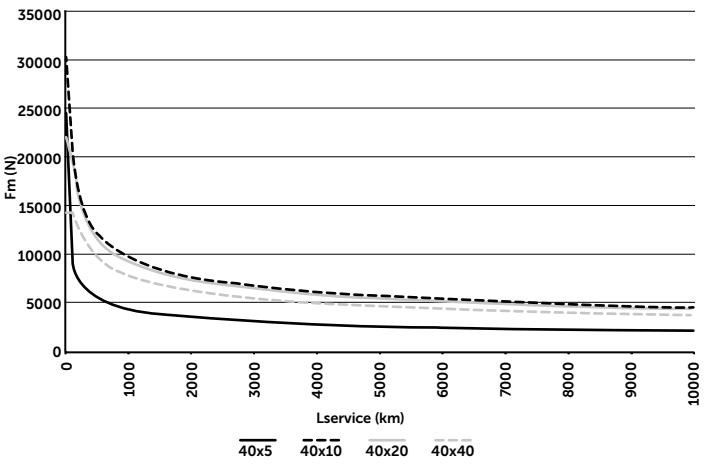
Ø63



Ø80



Ø100



Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH

Example for the selection of an electromechanical actuator
A mass of 95 kg is to be pulled 850 mm upwards at an angle of 60° by a device (5 kg). The instroke time is nine seconds.
The mass is removed from the device at the upper position (pause 2 s); the device is then lowered again within three seconds. After another three seconds, the cycle starts again.
The ambient temperature is between 20 and 35°C. There are no special material requirements. The device is not externally guided. The expected service life is approx. 1,000,000 load cycles.

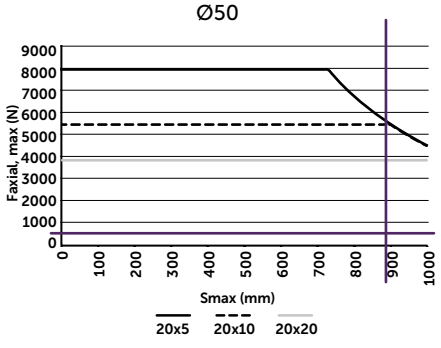
Step 1: Overview of the technical parameters

a)	Weight of the load to be lifted (instroke)	F_1	= (95 kg + 5 kg) x 10 m/s² =	1000 N
b)	Weight of the load to be lifted (outstroke)	F_2	= 5 kg x 10 m/s² =	50 N
c)	Required stroke length	s		8 50 mm
d)	Load case	L	Non-guided	3
e)	Ambient temperature	T_{max}		35°C
f)	Material requirements			keine
g)	Maximum speed (instroke)	v_1	$= \frac{\frac{\Delta x}{2}}{\frac{1}{3} t_{ein}}$ in m	0,142 m/s
h)	Maximum speed (outstroke)	v_2	$= \frac{\frac{\Delta x}{2}}{\frac{1}{3} t_{aus}}$ out m	0,425 m/s
i)	Mean speed	v_m	$= \sum_{j=1}^{n} \frac{t_j}{t_{tot}} \cdot v_j =$	0,106 m/s
j)	Mean Force	F_m	$= \sqrt[3]{\sum_{j=1}^{n} \left(F_j^3 \cdot \frac{v_j}{v_m} \cdot t_j / t_{tot} \right)} =$	795 N
k)	Life expectancy in load cycles	L_{Zykl}		1.000.000
l)	Life expectancy in km	L_{km}	1.000 .000 x (850 mm / 1.000.000 km/mm) x 2	1.700 km

Step 2: Selection of suitable actuators based on the working stroke
The maximum permissible order strokes for the individual actuators can be found in the table "**Technical data**" on page 1 of the data sheet. Size 32 and 40 have insufficient stroke for this application.

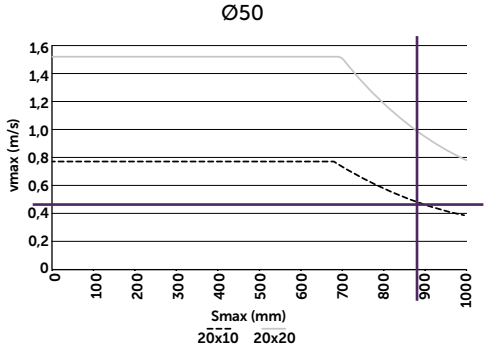
Cylinder Ø(mm)	32		40			50			63			80				100			
Spindle diameter (mm)	12		16			20			25			32				40			
Spindle pitch (mm)	5	10	5	10	16	5	10	20	5	10	25	5	10	20	32	5	10	20	40
Axial clearance Actuator (mm)	+ 0,02		+ 0,04			+ 0,04			+ 0,04			+ 0,04				+ 0,04	+ 0,07		
Dynamic force C (N)	5000	5100	10100	7900		13100	9700	6800	14600	14500	7400	23400	26500	16800	11400	25400	44600	33800	22800
F max axial (N)	3000	2520	5200	4100	4200	8000	5500	3800	10150	10100	4750	20000	20000	11950	7750	24600	30400	22200	14450
Momentum torque max (Drive shaft) (Nm)	2,4	4,0	4,2	6,5	10,8	6,4	8,8	12,2	8,1	16,1	19,0	16,0	31,9	38,1	39,6	19,6	48,4	70,7	92,2
Orderstroke (mm)	100 ... 800		100 ... 800			100 ... 1000			100 ... 1200			100 ... 1500				100 ... 1500			
Velocity/speed max (m/s)	0,6	1,3	0,5	1,0	1,6	0,4	0,8	1,5	0,3	0,6	1,5	0,2	0,5	0,9	1,5	0,2	0,4	0,8	1,6
RPM max spindle (1/min)	7690	7630	6470	6120	6000	4590	4660	4570	3610	3670	3640	2840	2830	2830	2820	2280	2380	2380	2370
Acceleration max (m/s²)	10																		
Max. angle of rotation at the piston rod (°)	0,65 °		0,6 °			0,5 °			0,4 °			0,3 °				0,25 °			

Step 3: Selection of suitable actuators based on the maximum permissible forces
The maximum permissible force depends on the order stroke and can be taken from the diagrams on pages 8 to 9 of the data sheet.
This application is installed according to "Load case 3". This means that all drives from size 50 are suitable for the application.

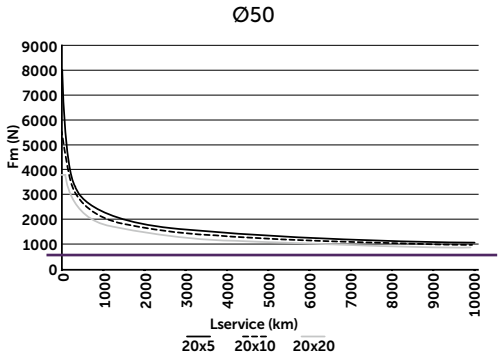


Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH

Step 4: Selection of suitable actuators based on the maximum permissible speed
The maximum permissible speed depends on the order stroke and can be taken from the diagrams on page 10 of the data.
The spindle 20x5 mm is omitted.



Step 5: Selection of suitable actuators based on estimated service life
The mean force acting on the actuator is used to calculate the service life. The mean force Fm can be calculated using the formula on page 7. With an average force of 795 N, a service life of > 1,700 km can be expected.



Step 6: Selection of the appropriate order stroke (working stroke + stroke reserve)
To prevent damage to the actuator, a stroke reserve of at least 20 mm is recommended at each end side:
Order stroke = working stroke + 2 x 20 mm
= 850 mm + 40 mm
= 890 mm

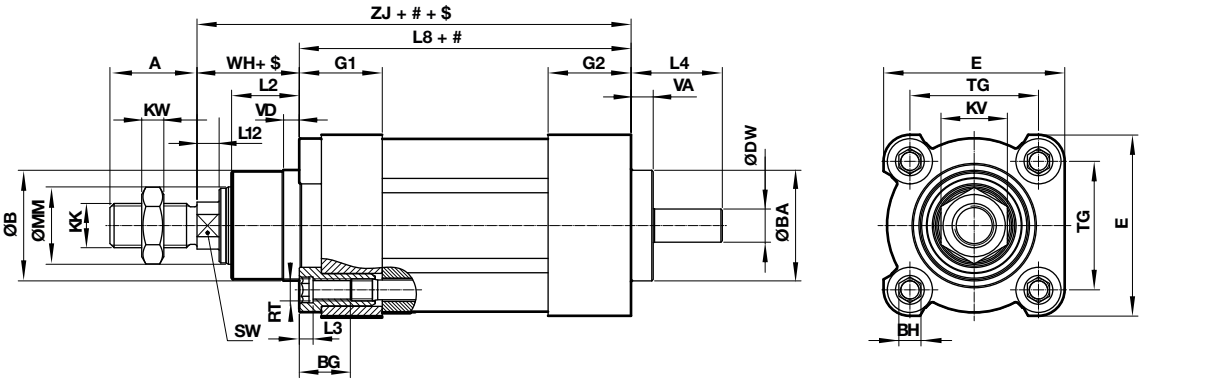
Step 7: Check all remaining parameters
e) temperature requirement of T_{max}=35°C is met
h) there are no specific requirements for the material

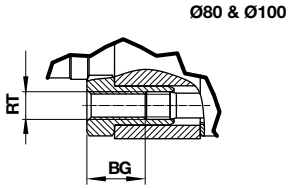
Result:
E/809050/10M/890 is the chosen electromechanical actuator, because it meets all requirements.

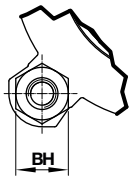
Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH

Basic dimensions
E/809000/**M/AXX, E/809000/**U/AXX
Actuator without motor, without coupling, without housing

Dimensions in mm
Projection/First angle







= Stroke
$ = piston rod extension

Ø	A -1	ØB d11	ØBA g6	BG min	BH	ØDW f7	E	G1	G2	KK	KV	KW	L2	L3 max	L4	L8	L12	ØMM h9
32	22	30	30	16	6	7	47	27	32	M10 x 1,25	17	5	15,5	4	24	107 ±0,4	5,5	20
40	24	35	35	16	6	9	55	27	37	M12 x 1,25	19	6	17,5	4	27,5	130,5 ±0,7	6,5	25
50	32	40	40	16	8	12	65,5	30	41	M16 x 1,5	24	8	24,5	5	33	131 ±0,7	8	28
63	32	45	50	16	8	14	74,5	30	49	M16 x 1,5	24	8	24,5	5	37,5	160 ±0,8	8	32
80	40	55	60	17	19	18	95	34	50,5	M20 x 1,5	30	10	30,5	–	39,5	184,5 ±0,8	10	40
100	40	70	72	17	19	22	113	41	57,5	M20 x 1,5	30	10	33,5	–	45,5	214,5 ±1	10	50

Ø	RT	SW	TG	VA	VD	WH (mech. end stop)	ZJ	Model
32	M6	10	32,5 ±0,5	7	6	26 ±1,4	133	E/809032/05*/AXX E/809032/10*/AXX
40	M6	13	38 ±0,5	7	6	30 ±1,4	160,5	E/809040/05*/AXX E/809040/10*/AXX E/809040/16*/AXX
50	M8	17	46,5 ±0,6	8	6	37 ±1,4	168	E/809050/05*/AXX E/809050/10*/AXX E/809050/20*/AXX
63	M8	17	56,5 ±0,7	8	6	37 ±1,8	197	E/809063/05*/AXX E/809063/10*/AXX E/809063/25*/AXX
80	M10	22	72 ±0,7	9	6	46 ±1,8	230,5	E/809080/05*/AXX E/809080/10*/AXX E/809080/20*/AXX E/809080/32*/AXX
100	M10	22	89 ±0,7	9	6	51 ±1,8	265,5	E/809100/05*/AXX E/809100/10*/AXX E/809100/20*/AXX E/809100/40*/AXX

Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH

Weights, moving mass, inertia
E/809000/**M/AXX, E/809000/**U/AXX
Actuator without motor, without coupling, without housing

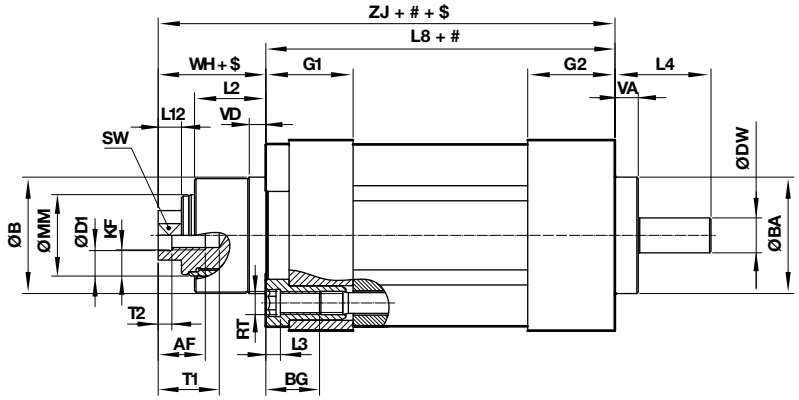
Ø	32		40			50		
Ball screw pitch (mm)	5	10	5	10	16	5	10	20
Weight at zero stroke (kg)	0,81	0,79	1,25	1,26	1,32	2,04	2,07	2,10
Weight per 100 mm stroke (kg / mm)	0,40	0,40	0,52	0,53	0,53	0,77	0,78	0,78
Moving mass at zero stroke (kg)	0,27	0,26	0,39	0,39	0,44	0,64	0,67	0,70
Moving mass per 100 mm stroke (kg / mm)	0,13	0,13	0,16	0,16	0,16	0,19	0,19	0,19
Rotating mass at zero stroke (kg)	0,14	0,14	0,27	0,28	0,28	0,46	0,47	0,47
Rotating mass per 100 mm stroke (kg / mm)	0,10	0,10	0,10	0,10	0,10	0,20	0,20	0,20
Mass moment of inertia at zero stroke (kg mm^2)	3,50	5,40	8,40	11,41	15,96	24,92	26,49	35,01
Mass moment of inertia per 100 mm stroke (kg mm^2 / mm)	1,50	1,70	3,00	4,00	4,90	10,70	11,10	12,70
Mass moment of inertia per 1 kg load (kg mm^2 / kg)	0,63	2,53	0,63	2,53	6,48	0,63	2,53	10,13

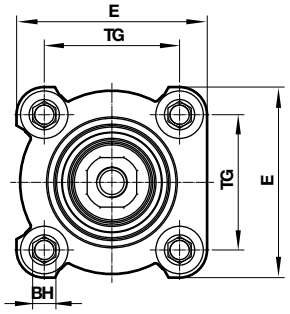
Ø	63			80				100			
Ball screw pitch (mm)	5	10	25	5	10	20	32	5	10	20	40
Weight at zero stroke (kg)	3,22	3,30	3,33	5,79	5,94	6,05	6,04	9,82	9,85	9,99	10,18
Weight per 100 mm stroke (kg / mm)	1,00	1,00	1,00	1,50	1,50	1,50	1,50	2,10	2,00	2,00	2,00
Moving mass at zero stroke (kg)	0,96	1,04	1,07	1,90	2,03	2,14	2,14	3,11	3,34	3,48	3,66
Moving mass per 100 mm stroke (kg / mm)	0,20	0,20	0,20	0,30	0,30	0,30	0,30	0,50	0,50	0,50	0,50
Rotating mass at zero stroke (kg)	0,96	0,97	0,97	1,60	1,61	1,61	1,60	2,77	2,58	2,58	2,59
Rotating mass per 100 mm stroke (kg / mm)	0,30	0,40	0,30	0,60	0,60	0,60	0,60	0,90	0,80	0,80	0,80
Mass moment of inertia at zero stroke (kg mm^2)	80,42	80,00	94,66	211,96	204,13	226,95	243,13	558,98	503,78	512,54	545,99
Mass moment of inertia per 100 mm stroke (kg mm^2 / mm)	28,30	28,20	31,20	75,30	71,70	81,10	85,60	179,90	149,00	152,30	166,60
Mass moment of inertia per 1 kg load (kg mm^2 / kg)	0,63	2,53	15,83	0,63	2,53	10,13	25,94	0,63	2,53	10,13	40,53

Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH

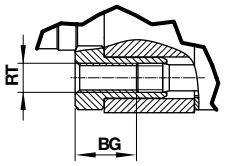
Basic dimensions
E/809000/**X/AXX
Actuator with internal piston thread, without motor, without coupling, without housing

Dimensions in mm
Projection/First angle





Ø80 & Ø100





= Stroke
$ = piston rod extension

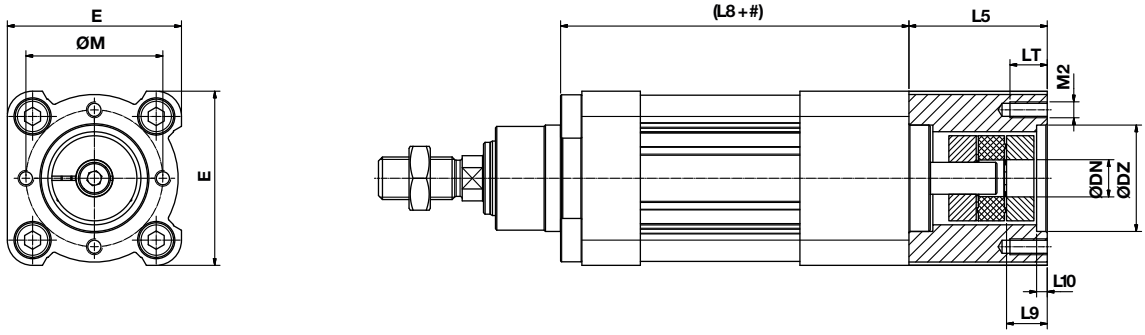
Ø	AF -1	ØB d11	ØBA g6	BG min	BH	ØD1	ØDW f7	E	G1	G2	KF	L2	L3 max	L4	L8	L12	ØMM h9
32	12	30	30	16	6	6,4	7	47	27	32	M6	15,5	4	24	107 ±0,4	5,5	20
40	12	35	35	16	6	8,4	9	55	27	37	M8	17,5	4	27,5	130,5 ±0,7	6,5	25
50	16	40	40	16	8	10,5	12	65,5	30	41	M10	24,5	5	33	131 ±0,7	8	28
63	16	45	50	16	8	10,5	14	74,5	30	49	M10	24,5	5	37,5	160 ±0,8	8	32
80	20	55	60	17	19	13	18	95	34	50,5	M12	30,5	–	39,5	184,5 ±0,8	10	40
100	20	70	72	17	19	13	22	113	41	57,5	M12	33,5	–	45,5	214,5 ±1	10	50

Ø	RT	SW	T1	T2	TG	VA	VD	WH (mech. end stop)	ZJ	Model
32	M6	10	16	2,6	32,5 ±0,5	7	6	26 ±1,4	133	E/809032/05X/AXX E/809032/10X/AXX
40	M6	13	16	3,3	38 ±0,5	7	6	30 ±1,4	160,5	E/809040/05X/AXX E/809040/10X/AXX E/809040/16X/AXX
50	M8	17	21	4,7	46,5 ±0,6	8	6	37 ±1,4	168	E/809050/05X/AXX E/809050/10X/AXX E/809050/20X/AXX
63	M8	17	21	4,7	56,5 ±0,7	8	6	37 ±1,8	197	E/809063/05X/AXX E/809063/10X/AXX E/809063/25X/AXX
80	M10	22	25	6,1	72 ±0,7	9	6	46 ±1,8	230,5	E/809080/05X/AXX E/809080/10X/AXX E/809080/20X/AXX E/809080/32X/AXX
100	M10	22	25	6,1	89 ±0,7	9	6	51 ±1,8	265,5	E/809100/05X/AXX E/809100/10X/AXX E/809100/20X/AXX E/809100/40X/AXX

Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH

Basic dimensions
E/809000/***/B**
Actuator with coupling and housing for customer individual motor flange

Dimensions in mm
Projection/First angle

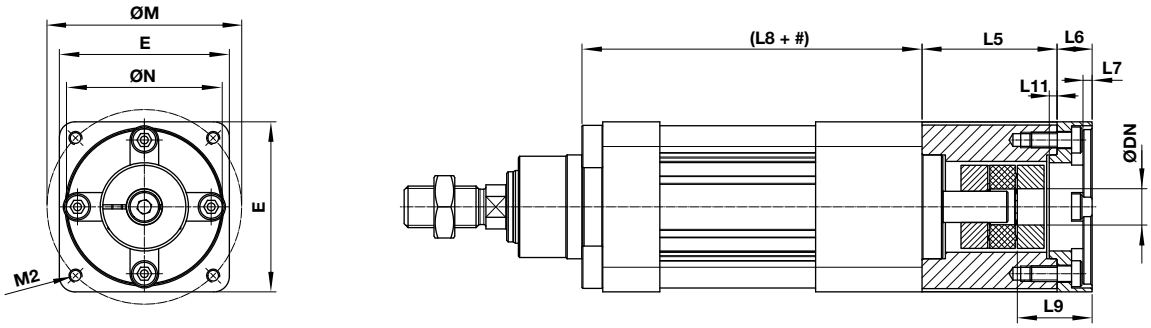


= Stroke

Ø	ØDN H7*	ØDZ H7	E	L5	L9	L10	LT	M2	ØM	Weight motor mounting kit (kg)	Model
32	7, 8, 9	30	47	39	11	3	10	M4	36	0,20	E/809032/***/B**
40	9, 12, 14	37	55	42	10,3	3	10	M4	44	0,28	E/809040/***/B**
50	9, 12, 14	40	65,5	52	15,3	4	14	M6	51,5	0,52	E/809050/***/B**
63	14, 18, 19	50	74,5	61	17	3	14	M6	60	0,75	E/809063/***/B**
80	14, 18, 19	60	95	64	16	4	17	M6	76	1,30	E/809080/***/B**
100	19, 22, 24	72	113	75	25	4	17	M8	90,5	2,10	E/809100/***/B**

* For more versions please contact technical service.

Basic dimensions
E/809000/***/DX*
Actuator with axial motor mounting kit

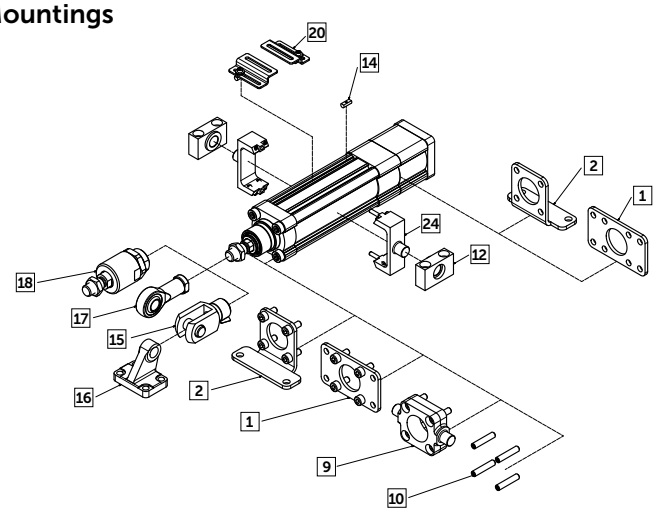


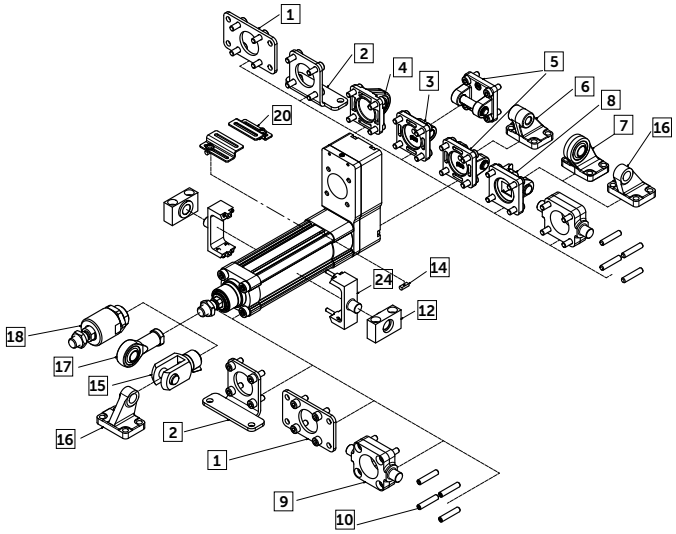
= stroke

Ø	ØDN H7	E	L5	L6	L7	L8	L9	L11	M2	ØN G7	ØM	Weight motor mounting kit (kg)	Model
32	8	47	39	11,5	3	107 ±0,4	22	2	M4	30	46	0,25	E/809032/***/DX1
32	9	53	39	9	3	107 ±0,4	19,5	2	M5	40	63	0,25	E/809032/***/DX2
40	9	55	42	10	3	130,5±0,7	20,3	2	M5	40	63	0,34	E/809040/***/DX1
40	14	65,5	42	18,5	3,5	130,5±0,7	28,8	2	M5	60	75	0,42	E/809040/***/DX2
50	14	65,5	52	13,5	3,5	131±0,7	28,8	3	M5	60	75	0,64	E/809050/***/DX1
63	14	75	61	12	3	160±0,8	29	2	M5	60	75	0,90	E/809063/***/DX1
63	19	85	61	22	3,5	160±0,8	39	2	M6	80	100	1,05	E/809063/***/DX2
80	14	95	64	13,5	3,5	184,5±0,8	29,5	3	M5	60	75	1,60	E/809080/***/DX1
80	19	95	64	22	3,5	184,5±0,8	38	3	M6	80	100	1,70	E/809080/***/DX2
100	19	115,8	75	14	3,5	214,5±1	39	3	M6	80	100	2,50	E/809100/***/DX1
100	24	115,8	75	24	3,5	214,5±1	49	3	M8	110	130	2,70	E/809100/***/DX2

Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH

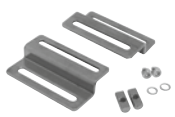
Mountings





Model	A	AK	B, G	C	D	D2
						
	10	18	1	2	5	8
Ø	Page 20	Page 20	Page 20	Page 21	Page 21	Page 21
32	QM/8032/35	QM/8025/38	QE/809032/22	QE/809032/21	QA/8032/23	QA/8032/42
40	QM/8032/35	QM/8040/38	QE/809040/22	QE/809040/21	QA/8040/23	QA/8040/42
50	QM/8050/35	QM/8050/38	QE/809050/22	QE/809050/21	QA/8050/23	QA/8050/42
63	QM/8050/35	QM/8050/38	QE/809063/22	QE/809063/21	QA/8063/23	QA/8063/42
80	QM/8080/35	QM/8080/38	QE/809080/22	QE/809080/21	QA/8080/23	QA/8080/42
100	QM/8080/35	QM/8080/38	QE/809100/22	QE/809100/21	QA/8100/23	QA/8100/42

Model	F	FH	UH	S	SW	UF
						
	15	9	24	12	6	17
Ø	Page 22	Page 22	Page 22	Page 23	Page 24	Page 23
32	QM/8025/25	QA/8032/34	PQA/802032/40	QA/8032/41	M/P19493	QM/8025/32
40	QM/8040/25	QA/8040/34	PQA/802040/40	QA/8040/41	M/P19494	QM/8040/32
50	QM/8050/25	QA/8050/34	PQA/802050/40	QA/8040/41	M/P19495	QM/8050/32
63	QM/8050/25	QA/8063/34	PQA/802063/40	QA/8063/41	M/P19496	QM/8050/32
80	QM/8080/25	–	PQA/802080/40	QA/8063/41	M/P19497	QM/8080/32
100	QM/8080/25	–	PQA/802100/40	QA/8100/41	M/P19498	QM/8080/32

Model	UR	R	SS	US	Groove key	Mounting kit
						
	4	3	16	7	14	20
Ø	Page 23	Page 24	Page 24	Page 25	Page 25	Page 25
32	QA/8032/33	QA/8032/27	M/P19931	M/P40310	M/P72816	PQA/802032/22/54
40	QA/8040/33	QA/8040/27	M/P19932	M/P40311	M/P72816	PQA/802032/22/54
50	QA/8050/33	QA/8050/27	M/P19933	M/P40312	M/P72816	PQA/802050/22/54
63	QA/8063/33	QA/8063/27	M/P19934	M/P40313	M/P72816	PQA/802050/22/54
80	QA/8080/33	QA/8080/27	M/P19935	M/P40314	M/P72816	PQA/802080/22/54
100	QA/8100/33	QA/8100/27	M/P19936	M/P40315	M/P72816	PQA/802080/22/54

Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH

Pos.	Style	Standard
1	B, G	Galvanised steel
2	C	Galvanised steel
3	R	Die-cast aluminium
4	UR	Die-cast aluminium Inner ring: steel, Outer ring: brass
5	D	Die-cast aluminium Bolt: Galvanised steel (martensitic) Circlip: Galvanised steel
6	SW	Die-cast aluminium
7	US	Galvanised cast iron Inner ring: steel, Outer ring: brass

Pos.	Style	Standard
8	D2	Die-cast aluminium Bolt: stainless steel (martensitic), Circlip: Galvanised steel
9	FH	Galvanised cast iron
10	A	Galvanised steel
12	S	Anodised aluminium Bearing: brass
14	Groove key	Steel
15	F	Galvanised steel, Bolt: galvanised steel, Circlip: Galvanised steel
16	SS	Galvanised cast iron

Pos.	Style	Standard
17	UF	Galvanised steel, Inner ring: steel, Outer ring: brass
18	AK	Galvanised steel
24	UH	Anodised aluminium

Magnetically operated switches

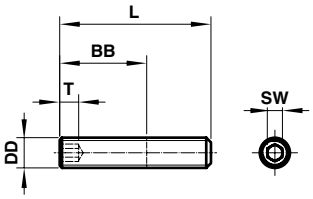
Model	M/50/**	Groove cover
		
Ø	Page 26	Page 25
32		M/P72725/1000
40		M/P72725/1000
50		M/P72725/1000
63		M/P72725/1000
80		M/P72725/1000
100		M/P72725/1000

Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH

Mountings
Front or rear stud mounting A

Dimensions in mm
Projection/First angle

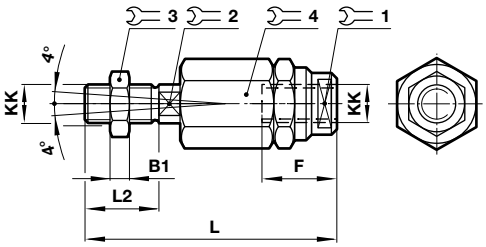




Ø	BB	DD	L	SW	T min	(kg)	Model (A)
32/40	17	M6	30	3	3,5	0,02	QM/8032/35
50/63	23	M8	40	4	5	0,05	QM/8050/35
80/100	28	M10	45	5	6	0,08	QM/8080/35

Piston rod swivel
AK

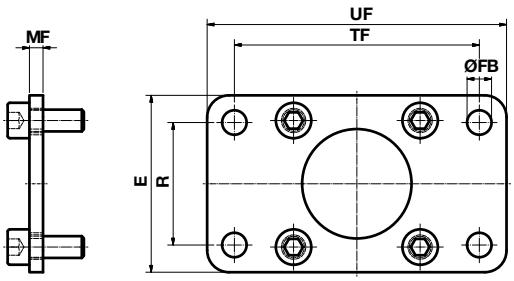




Ø	KK	B1	F	L	L2	SW 1	SW 2	SW 3	SW 4	(kg)	F_{max} (N)	Model (AK)
32	M10 x 1,25	5	26	73	20	19	12	17	30	0,20	1.600	QM/8025/38
40	M12 x 1,25	6	26	77	24	19	12	19	30	0,20	2.500	QM/8040/38
50/63	M16 x 1,5	8	34	106	32	30	19	24	42	0,65	6.200	QM/8050/38
80/100	M20 x 1,5	10	42	122	40	30	19	30	42	0,72	15.700	QM/8080/38

Front flange B, G
Based on ISO 15552, type MF1 and MF2





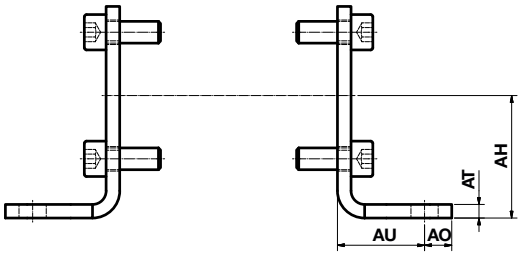
Ø	E	ØFB	MF	R	TF	UF	(kg)	F_{max} (N)	Model (B, G)
32	50	7	4	32	64	80	0,24	1.600	QE/809032/22
40	55	9	4	36	72	90	0,28	2.500	QE/809040/22
50	65	9	5	45	90	110	0,54	3.900	QE/809050/22
63	75	9	5	50	100	125	0,66	6.200	QE/809063/22
80	100	12	6	63	126	154	1,3	10.000	QE/809080/22
100	120	14	6	75	150	186	1,82	15.700	QE/809100/22

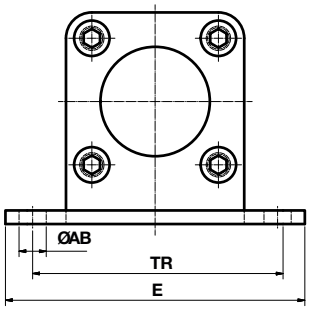
Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH

Foot mounting C
Based on ISO 15552 , type MS1

Dimensions in mm
Projection/First angle



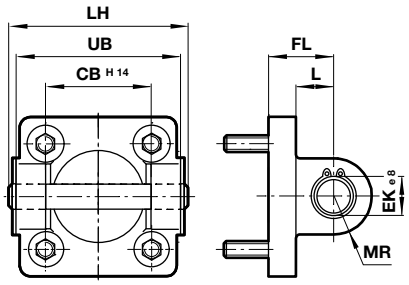




Ø	ØAB	AH	AO	AT	AU	E	TR	(kg)	F_{max} (N)	Model (C)
32	7	32	8	4	24	80	64	0,14	1.600	QE/809032/21
40	10	36	9	4	28	90	72	0,18	2.500	QE/809040/21
50	10	45	10	5	32	110	90	0,27	3.900	QE/809050/21
63	10	50	12	5	32	125	100	0,39	6.200	QE/809063/21
80	12	63	19	6	41	154	126	0,78	10.000	QE/809080/21
100	14,5	71	19	6	41	186	150	0,97	15.700	QE/809100/21

Rear clevis D
Conforms to ISO 15552, type MP2

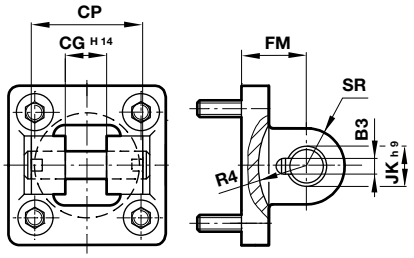




Ø	CB H14	ØEK e8	FL	L	LH	MR	UB	(kg)	F_{max} (N)	Model (D)
32	26	10	22	13	52	9	45	0,11	1.600	QA/8032/23
40	28	12	25	16	60	12	52	0,16	2.500	QA/8040/23
50	32	12	27	17	68	12	60	0,22	3.900	QA/8050/23
63	40	16	32	22	79	15	70	0,34	6.200	QA/8063/23
80	50	16	36	22	99	15	90	0,54	10.000	QA/8080/23
100	60	20	41	27	119	20	110	0,90	15.700	QA/8100/23

Rear clevis D2
Conforms to ISO 15552, type AB6





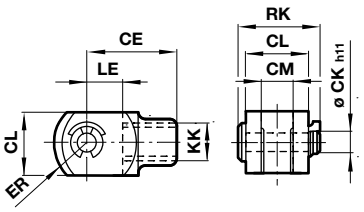
Ø	CG H14	CP	B3	ØJK h9	FM	SR	R4	(kg)	F_{max} (N)	Model (D2)
32	14	34	3,3	10	22	11	17	0,20	1.600	QA/8032/42
40	16	40	4,3	12	25	12	20	0,23	2.500	QA/8040/42
50	21	45	4,3	16	27	14,5	22	0,36	3.900	QA/8050/42
63	21	51	4,3	16	32	18	25	0,55	6.200	QA/8063/42
80	25	65	4,3	20	36	22	30	0,90	10.000	QA/8080/42
100	25	75	4,3	20	41	22	32	1,45	15.700	QA/8100/42

Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH

Piston rod clevis F
Conforms to DIN ISO 8140

Dimensions in mm
Projection/First angle

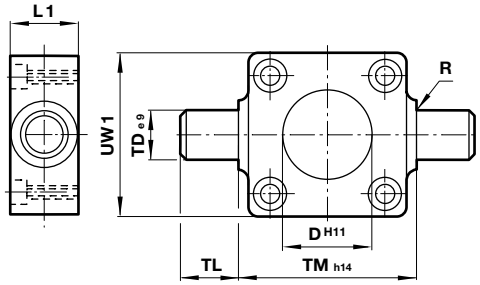




Ø	KK	CE	ØCK h11	CL	CM	ER	LE	RK	(kg)	F_{max} (N)	Model (F)
32	M10 x 1,25	40	10	20	10	16	20	27,5	0,09	1.600	QM/8025/25
40	M12 x 1,25	48	12	24	12	19	24	33,5	0,13	2.500	QM/8040/25
50/63	M16 x 1,5	64	16	32	16	25	32	42	0,33	6.200	QM/8050/25
80/100	M20 x 1,5	80	20	40	20	32	40	51	0,67	15.700	QM/8080/25

Front or rear detachable trunnion FH
Conforms to VDMA 24562 part 2, type MT 5/6

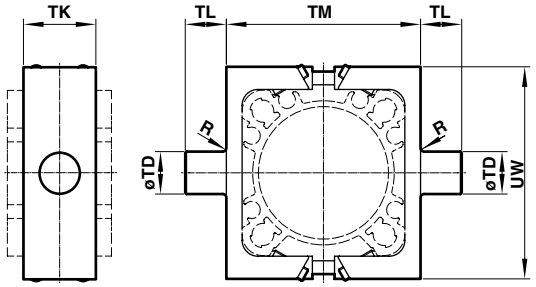


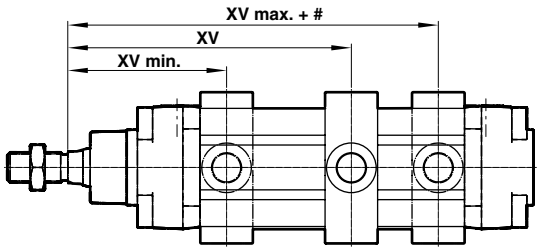


Ø	ØD H11	L1	R	ØTD e9	TL	TM h14	UW1	(kg)	F_{max} (N)	Model (FH)
32	30	16	1	12	12	50	45	0,20	1.600	QA/8032/34
40	35	20	1,6	16	16	63	55	0,38	2.500	QA/8040/34
50	40	24	1,6	16	16	75	65	0,60	3.900	QA/8050/34
63	45	24	1,6	20	20	90	75	1,10	6.200	QA/8063/34

Adjustable trunnion mounting UH
Conforms to ISO 15552, type MT4







Stroke

Ø	R	ØTD e9	TK max.	TL h14	TM h14	UW	XV min	XV max + #	(kg)	Torque (Nm)	F_{max} (N)	Model (UH)
32	1	12	25	12	50	58	65,5	88,5	0,06	0,8	1.600	PQA/802032/40
40	1,6	16	28	16	63	65	71	109,5	0,11	0,8	2.500	PQA/802040/40
50	1,6	16	28	16	75	80	81	113	0,16	3,0	3.900	PQA/802050/40
63	1,6	20	36	20	90	96	85	130	0,32	3,0	6.200	PQA/802063/40
80	1,6	20	36	20	110	116	98	162	0,37	4,0	10.000	PQA/802080/40
100	2	25	48	25	132	140	116	184	0,72	12,0	15.700	PQA/802100/40

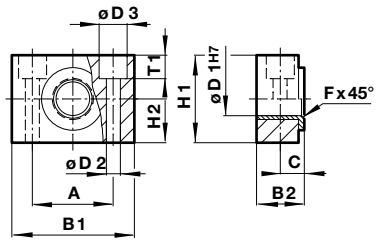
Note: Mounting Type "UH" generally, this mount will not be pre-assembled and will be delivered separately with the actuator. The mount has to be mounted and adjusted to the needs of the application. It has to be secured with at least the above given torque.
If a pre-assembly is required, the dimension "XV" from the piston rod shoulder to the centre of the trunnion needs to be specified. Please be aware, that this dimension is taken with a completely instroke piston rod without considering any safety stroke.

Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH

Trunnion support S
Conforms to ISO 15552, type AT4

Dimensions in mm
Projection/First angle

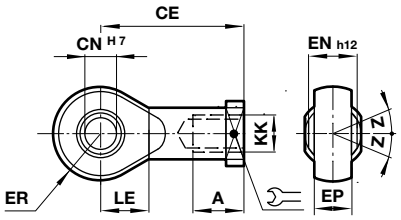




Ø	A	B1	B2	C	ØD1 H7	ØD2	ØD3	F x 45 °	H1	H2	T1	(kg)	Model (S)
32	32	46	18	10,5	12	6,6	11	1	30	15	6,8	0,10	QA/8032/41
40/50	36	55	21	12	16	9	15	1,6	36	18	9	0,14	QA/8040/41
63/80	42	65	23	13	20	11	18	1,6	40	20	11	0,18	QA/8063/41
100	50	75	28,5	16,5	25	14	20	2	50	25	13	0,34	QA/8100/41

Universal piston rod eye UF
Conforms to DIN ISO 8139

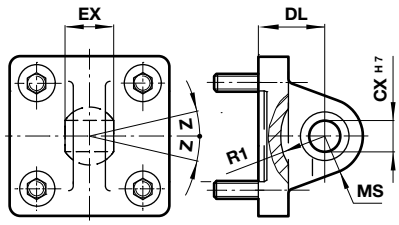




Ø	KK	A	CE	ØCN H7	EN h12	ER	LE	Z	(kg)	F_{max} (N)	Model (UF)
32	M10 x 1,25	20	43	10	14	14	15	9 °	0,09	1.600	QM/8025/32
40	M12 x 1,25	22	50	12	16	16	17	13 °	0,13	2.500	QM/8040/32
50/63	M16 x 1,5	28	64	16	21	21	22	15 °	0,33	6.200	QM/8050/32
80/100	M20 x 1,5	33	77	20	25	25	26	15 °	0,67	15.700	QM/8080/32

Universal rear eye UR
Conforms to ISO 15552, type MP6





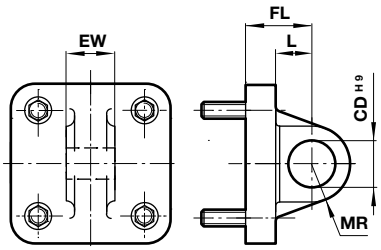
Ø	ØCX H7	EX	MS	DL	R1	Z	(kg)	F_{max} (N)	Model (UR)
32	10	14	16	22	13	13 °	0,15	1.600	QA/8032/33
40	12	16	18	25	16	13 °	0,25	2.500	QA/8040/33
50	16	21	21	27	19	15 °	0,40	3.900	QA/8050/33
63	16	21	23	32	22	15 °	0,55	6.200	QA/8063/33
80	20	25	28	36	24	14 °	0,90	10.000	QA/8080/33
100	20	25	30	41	27	14 °	1,50	15.700	QA/8100/33

Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH

Rear eye R
Conforms to ISO 15552, type MP4

Dimensions in mm
Projection/First angle

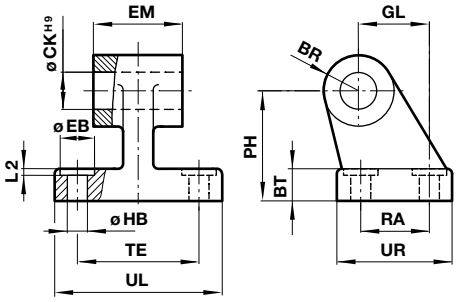




Ø	ØCD H9	EW	FL	L	MR	(kg)	F_{max} (N)	Model (R)
32	10	25,6	22	13	9	0,09	1.600	QA/8032/27
40	12	27,6	25	16	12	0,11	2.500	QA/8040/27
50	12	31,6	27	17	12	0,17	3.900	QA/8050/27
63	16	39,6	32	22	15	0,24	6.200	QA/8063/27
80	16	49,6	36	22	15	0,37	10.000	QA/8080/27
100	20	59,6	41	27	20	0,59	15.700	QA/8100/27

Wide hinge SW
Conforms to ISO 15552, type AB7

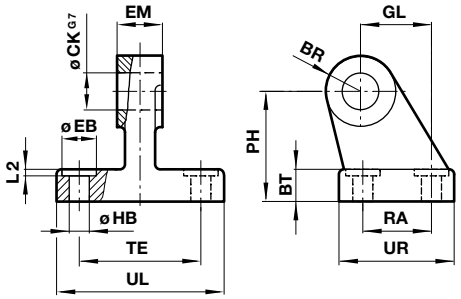




Ø	BR	BT	PH	ØCK H9	ØEB	EM	GL	ØHB	L2	RA	TE	UL	UR	(kg)	Model (SW)
32	10	7	32	10	12	25,6	21	6,6	1,6	18	38	50	31	0,05	M/P19493
40	11	9	36	12	12	27,6	24	6,6	1,6	22	41	53	35	0,07	M/P19494
50	13	11	45	12	15	31,6	33	9	1,6	30	50	65	45	0,14	M/P19495
63	15	11	50	16	15	39,6	37	9	1,6	35	52	67	50	0,18	M/P19496
80	15	14	63	16	18	49,6	47	11	2,5	40	66	84	60	0,28	M/P19497
100	18	15	71	20	18	59,6	55	11	2,5	50	76	94	70	0,42	M/P19748

Narrow hinge SS





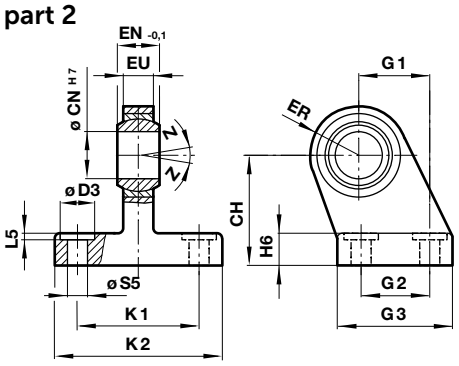
Ø	BR	BT	ØCK G7	ØEB	EM	GL	ØHB	L2	PH	RA	TE	UL	UR	(kg)	Model (SS)
32	10	8	10	11	10	21	6,6	1,6	32	18	38	51	31	0,15	M/P19931
40	11	10	12	11	12	24	6,6	1,6	36	22	41	54	35	0,20	M/P19932
50	13	12	16	15	16	33	9	1,6	45	30	50	65	45	0,48	M/P19933
63	15	12	16	15	16	37	9	1,6	50	35	52	67	50	0,50	M/P19934
80	15	14	20	18	20	47	11	2,5	63	40	66	86	60	0,75	M/P19935
100	19	15	20	18	20	55	11	2,5	71	50	76	96	70	1,20	M/P19936

Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH

Swivel hinge US
Conforms to VDMA 24562 part 2

Dimensions in mm
Projection/First angle

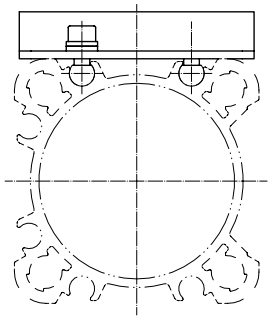


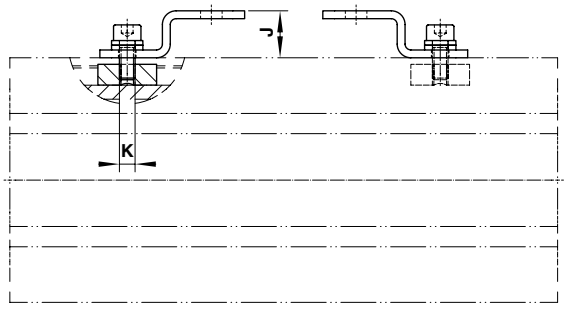


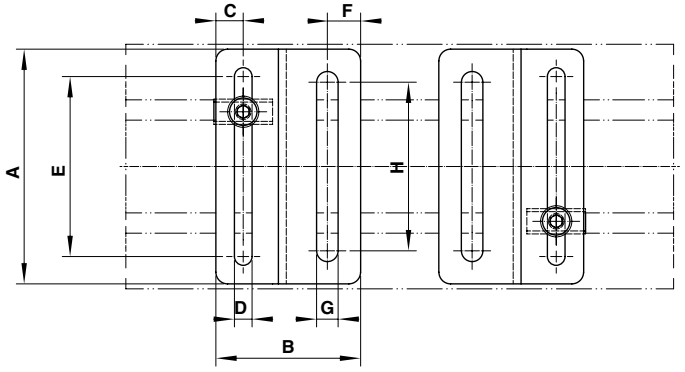
Ø	CH	ØCN H7	ØD3	EN -0,1	ER	EU	G1	G2	G3	H6	K1	K2	L5	S5	Z	(kg)	Model (US)
32	32	10	11	14	16	10,5	21	18	31	10	38	51	1,6	6,6	13 °	0,19	M/P40310
40	36	12	11	16	18	12	24	22	35	10	41	54	1,6	6,6	13 °	0,24	M/P40311
50	45	16	15	21	21	15	33	30	45	12	50	65	1,6	9	15 °	0,46	M/P40312
63	50	16	15	21	23	15	37	35	50	12	52	67	1,6	9	15 °	0,59	M/P40313
80	63	20	18	25	28	18	47	40	60	14	66	86	2,5	11	14 °	1,03	M/P40314
100	71	20	18	25	30	18	55	50	70	15	76	96	2,5	11	14 °	1,40	M/P40315

Mounting kit for profile barrel





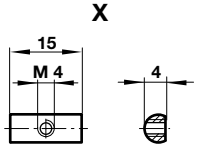




Ø	A	B	C	D	E	F	G	H	J	K	SW	(kg)	Model
32/40	45	37	7	4,5	31	8,5	5,5	28,1	12	M4	3	0,06	PQA/802032/22/54
50/63	60	37	7	4,5	46	8,5	5,5	43	12	M4	3	0,08	PQA/802050/22/54
80/100	90	37	7	4,5	76	8,5	6,5	70	12	M4	3	0,11	PQA/802080/22/54

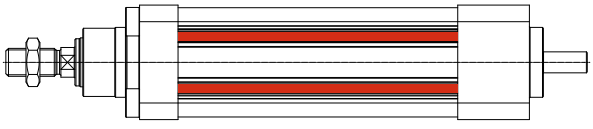
Groove key M/P72816
Weight: 0,01 (kg)

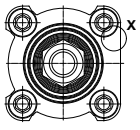


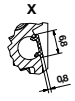


Groove cover M/P72725/1000









Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH

- Magnetically operated reed switch - Round style
- Suitable for all cylinder ranges with magnetic piston
- Switches can be mounted flush with the delivered special adaptor
- LED indicator on LSU models
- Alternative variants allow a wide range of application



Technical features

Operation:
M/50/LSU Normally open with LED (yellow)

Switching voltage (Ub):
10 ... 240 VAC/170 VDC

Switching voltage output:
Ub - 2,7 V

Switching current (see graph overleaf):
0,18 A max.

Switching power:
10 W/10 VA max.

Contact resistance:
150 mΩ

Response time:
1,8 ms

Operating temperature:
-25 ... +80°C (-13 ... +176°F)

High temperature version:
+150°C max. (+302°F)

Protection rating (EN 60529):
IP66

Shock resistance:
50 g (during 11 ms)

Vibration resistance:
35 g (at 2000 Hz)

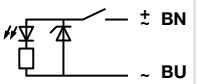
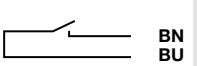
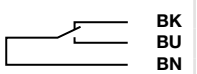
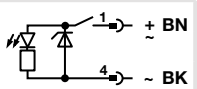
Cable type:
2 x 0,25: PVC, PUR or silikone
3 x 0,25 PVC

Cable length:
2, 5 or 10 m

Electromagnetic compatibility according to:
EN 60947-5-2

Materials:
Body: plastic
Cable: see table below

Technical data - Reed switches - additional information see data sheet en 4.3.005

Symbol	Voltage (VAC)	(VDC)	Current maximum (mA)	Function	Operating tempera-ture (°C)	LED	Protection class	Plug	Cable length (m)	Cable type	Weight (g)	Model
	10 ... 240	10 ... 170	180	Normally open	-25 ... +80	•	IP 66	–	2, 5 or 10	PVC 2 x 0,25	37	M/50/LSU/*V
	10 ... 240	10 ... 170	180	Normally open	-25 ... +80	•	IP 66	–	5	PUR 2 x 0,25	37	M/50/LSU/5U
	10 ... 240	10 ... 170	180	Normally open	-25 ... +150	–	IP 66	–	2	Silicon 2 x 0,25	37	TM/50/RAU/2S
	10 ... 240	10 ... 170	180	Changeover	-25 ... +80	–	IP 66	–	5	PVC 3 x 0,25	37	M/50/RAC/5V
	10 ... 60	10 ... 60	180	Normally open	-25 ... +80	•	IP 66	M8 x 1	0,3	PVC 3 x 0,25	16	M/50/LSU/CP *1)
	10 ... 60	10 ... 60	180	Normally open	-25 ... +80	•	IP 66	M12 x 1	0,3	PVC 3 x 0,25	16	M/50/LSU/CC *1)

* Insert cable length; *1) Plug-in connector

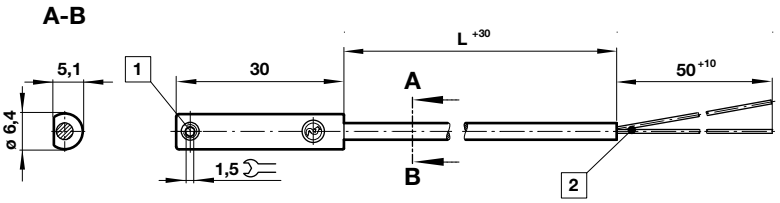
Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH

Dimensions

M/50/LSU/*V, M/50/LSU/5U,
TM/50/RAU/2S
Cable length L = 2, 5 or 10 m

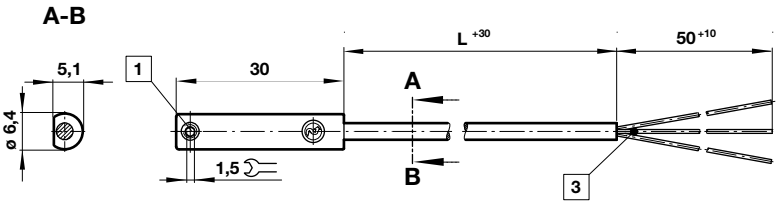
Dimensions in mm
Projection/First angle





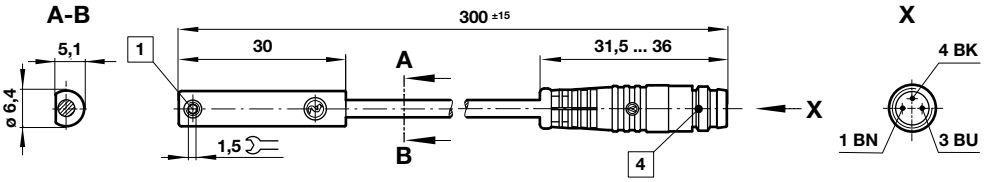
M/50/RAC/5V
Cable length L = 5 m





M/50/LSU/CP
M/50/LSU/CC





1 Fixing screw
2 Color code: BN = brown (+); BU = blue (output)
3 Color code: BK = black (output); BN = brown (+); BU = blue (output)
4 Version CP: plug M8 x 1; 1 BN = +; 4 BK = output; 3 BU = no function
Version CC: plug M12 x 1; 1 BN = +; 4 BK = output; 3 BU = no function

Accessories

Plug-in connector cable with nut



Outer cover	Cable length (m)	Weight (kg)	Connector	Connector
PVC 3 x 0,25	5	0,18	M8 x 1	M/P73001/5
PUR 3 x 0,25	5	0,18	M8 x 1	M/P73002/5
PUR 3 x 0,34	5	0,21	M12 x 1	M/P34594/5

Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH

- Magnetically operated switch, solid state - round style
- IO-Link version available
- Suitable for all cylinder ranges with magnetic piston
- Switches can be mounted flush in all profile cylinders
- Reliable switching with a very fast reponse time
- Particularly suited for use in high levels of vibration
- LED indicator as standard
- UL listed



Technical features

Operation:
PNP / NPN (see table)
Output with LED (yellow)
Normally open (standard)

Switching voltage (Ub):
10 ... 30 V d.c.
("supply class 2" acc. to cULus)

Voltage drop at output:
< 2,5 V

Residual current:
< 0,5 mA

Switching current (see graph):
100 mA max. (standard)
300 mA max. (M/50/EHP)

Switching power:
3,0 W max. (standard)
9,0 W max. (M/50/EHP)

Response time:
< 0,1 ms (standard)
< 5 ms (M/50/IOP)

Operating frequency:
1 kHz (standard)
200 Hz (M/50/IOP)

Responsiveness:
2,8 mT

Hysteresis:
0,5 ... 1,5 mT
0,2 mT (M/50/IOP)

Repeatability:
< 0,1 mT

Protection rating (EN 60529):
IP67 (standard)
IP68 (M/50/EAP/5U, M/50/EHP/5U)

Operating temperature:
-40 ... +80°C (-40 ... 176°F)
(permanently fixed cable)
-25 ... +80°C (-13 ...176°F)
(moving cable)

Cable type:
PVC 3 x 0,14 mm² (standard)
PUR 3 x 0,14 mm² (M/50/E*P/*U and all variants with connector)

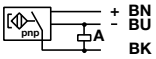
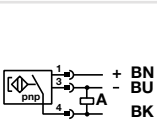
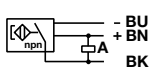
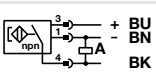
Cable length:
2, 5 and 10 m

Electromagnetic compatibility according to:
EN 60947-5-2

Materials:
Housing: plastic
Thread insert: brass
Set screw: stainless steel
Cable: see table below

Mounting type:
Flush mountable

Technical data - Solid state - additional information see data sheet en 4.3.007

Symbol	Voltage (V DC)	Current maximum (mA)	Function	IO-Link *1)	Operating temperature (°C)	LED	Protection class	Connector	Cable length (m)	Cable type	Weight (g)	Model
	10 ... 30	100	PNP		-40 ... +80	•	IP67	---	2	PVC 3 x 0,14	23	M/50/EAP/2V
	10 ... 30	100	PNP		-40 ... +80	•	IP67	---	5	PVC 3 x 0,14	56	M/50/EAP/5V
	10 ... 30	100	PNP		-40 ... +80	•	IP67	---	10	PVC 3 x 0,14	102	M/50/EAP/10V
	10 ... 30	100	PNP / NPN	•	-40 ... +80	•	IP67	---	5	PVC 3 x 0,14	56	M/50/IOP/5V
	10 ... 30	100	PNP		-40 ... +80	•	IP68	---	5	PUR 3 x 0,14	56	M/50/EAP/5U
	10 ... 30	100	PNP		-40 ... +80	•	IP67	---	10	PUR 3 x 0,14	102	M/50/EAP/10U
	10 ... 30	300	PNP		-40 ... +80	•	IP67	---	2	PVC 3 x 0,14	23	M/50/EHP/2V
	10 ... 30	300	PNP		-40 ... +80	•	IP67	---	5	PVC 3 x 0,14	56	M/50/EHP/5V
	10 ... 30	300	PNP		-40 ... +80	•	IP67	---	10	PVC 3 x 0,14	102	M/50/EHP/10V
	10 ... 30	300	PNP		-40 ... +80	•	IP68	---	5	PUR 3 x 0,14	56	M/50/EHP/5U
	10 ... 30	100	PNP		-40 ... +80	•	IP67	M8 x 1	0,3	PUR 3 x 0,14	7	M/50/EAP/CP
	10 ... 30	100	PNP / NPN	•	-40 ... +80	•	IP67	M8 x 1	0,3	PUR 3 x 0,14	7	M/50/IOP/CP
	10 ... 30	100	PNP		-40 ... +80	•	IP67	M12 x 1	0,3	PUR 3 x 0,14	16	M/50/EAP/CC
	10 ... 30	100	PNP		-40 ... +80	•	IP67	M12 x 1	2	PUR 3 x 0,14	35	M/50/EAP/CC/2
	10 ... 30	100	PNP / NPN	•	-40 ... +80	•	IP67	M12 x 1	0,3	PUR 3 x 0,14	16	M/50/IOP/CC
	10 ... 30	300	PNP		-40 ... +80	•	IP67	M8 x 1	0,3	PUR 3 x 0,14	7	M/50/EHP/CP
	10 ... 30	100	NPN		-40 ... +80	•	IP67	---	2	PVC 3 x 0,14	23	M/50/EAN/2V
	10 ... 30	100	NPN		-40 ... +80	•	IP67	---	5	PVC 3 x 0,14	56	M/50/EAN/5V
	10 ... 30	100	NPN		-40 ... +80	•	IP67	---	10	PVC 3 x 0,14	102	M/50/EAN/10V
	10 ... 30	100	NPN		-40 ... +80	•	IP67	M8 x 1	0,3	PUR 3 x 0,14	7	M/50/EAN/CP

Color code: see next page
*1) IO-Link functionality: see next page

Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH

IO-Link Switch conforming to IEC 61131-9

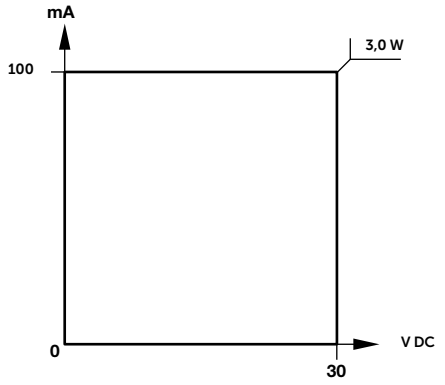
Properties and Functionality	M/50/EAP, M/50/EAN M/50/EHP	M/50/IOP	
Operating Mode	Standard	Standard	
Power LED		•	•
LED sensor signal	•	•	•
Normally open (delivery status)	•	•	•
Normally closed		O	•
Delay mode		O	•
Installation aid		•	•
Temperature measurement			•
Detection counter			•
Teach functionality			•
Responsiveness adjustment			•

Note: IODD for the M/50/IOP switches available on the Norgren homepage.
https://www.norgren.com/uk/en/technical-support/software

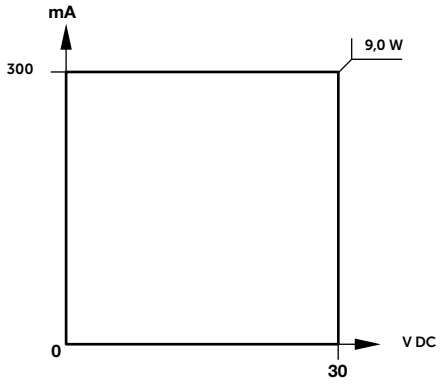
• = included
O = optional (manufacture pre-setting required)

Switching current and switching voltage

M/50/EAP, M/50/EAN, M/50/IOP



M/50/EHP

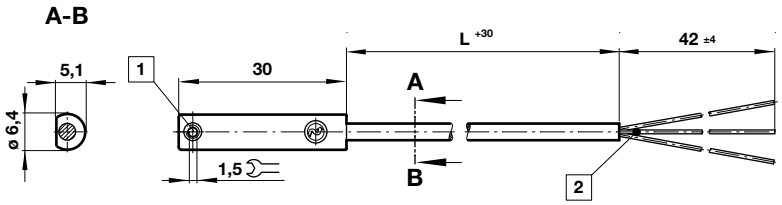


Dimensions

Dimensions in mm
Projection/First angle

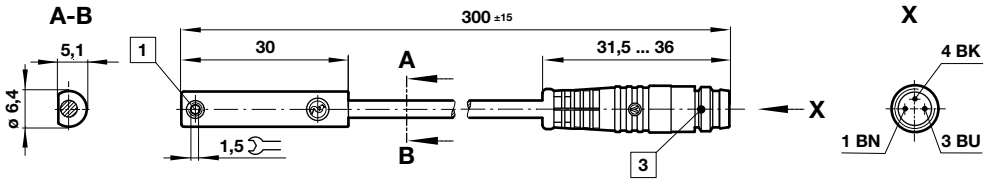
M/50/EAP/*V,
M/50/EAP/*U,
M/50/IOP/5V,
M/50/EHP/*V,
M/50/EHP/5U,
M/50/EAN/*V
Cable length L = 2, 5 or 10 m





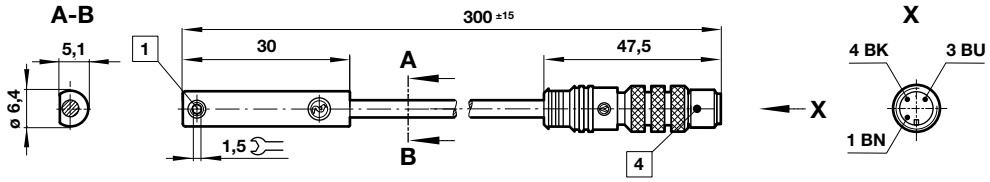
M/50/EAP/CP,
M/50/EAN/CP,
M/50/IOP/CP,
M/50/EHP/CP





M/50/EAP/CC,
M/50/IOP/CC,
M/50/EHP/CC





1 Fixing screw
2 Color code: BK = black (output); BN = brown (+); BU = blue (-)
3 Connector M8 x 1; 1 BN = +; 3 BU = -; 4 BK = output
4 Connector M12 x 1; 1 BN = +; 3 BU = -; 4 BK = output

Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH

Warning
These products should only be used where the values listed under "**Technical features/data**" are not exceeded.
Please refer to the corresponding catalogue page.
Before using the products in non-industrial applications, in life-support or other systems not included in the published instructions, please contact the manufacturer directly. Misuse, wear, or malfunction can cause components to fail in a variety of ways.

System designers are strongly recommended to consider the failure modes of all component parts used and to take adequate safety precautions to prevent personal injury and damage to equipment in the event of such failure.
System designers and end users are cautioned to review specific warnings found in instruction sheets packed and shipped with these products.

Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document. (2019-9468) © 2021 Bahr Modultechnik GmbH