



world of motion

SERVOACTUATORS RAVEO



RV/809000/* Electromechanical actuator with or without servo motor

Ø32 ... 100 mm

Robust construction

Cylinder based on
ISO 15552

Maintenance-free

Reliable performance

Long life

Servo motors

Optional with IP65

Different feedback
systems available

Holding brake available

Drives available
with EtherCAT,
PROFINET, PROFIBUS,
EtherNet/IP,
DeviceNet & CANopen
communications

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
(see graph page 11)

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

Drive data

Voltage:

400 VAC

Rated current:

3 ... 10,5 A

Output power:

0,75 ... 4,0 kW

Duty cycle:

100 %

Operating temperature

0 ... 80 °C (32 ... 176 °F)

IP Protection rates:

Actuator: IP40 (optional with IP65)

Motor: IP65

Standard Materials:

Barrel: Anodized aluminum

End covers: Anodized aluminum

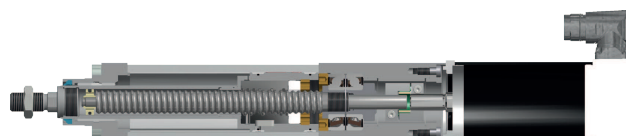
Piston rod: Stainless steel

(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				+ 0,07			
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 RAVEO 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/s ²)	10																		
Max. angle of rotation at the piston rod (°)	0,65		0,6			0,5			0,4			0,3				0,25			

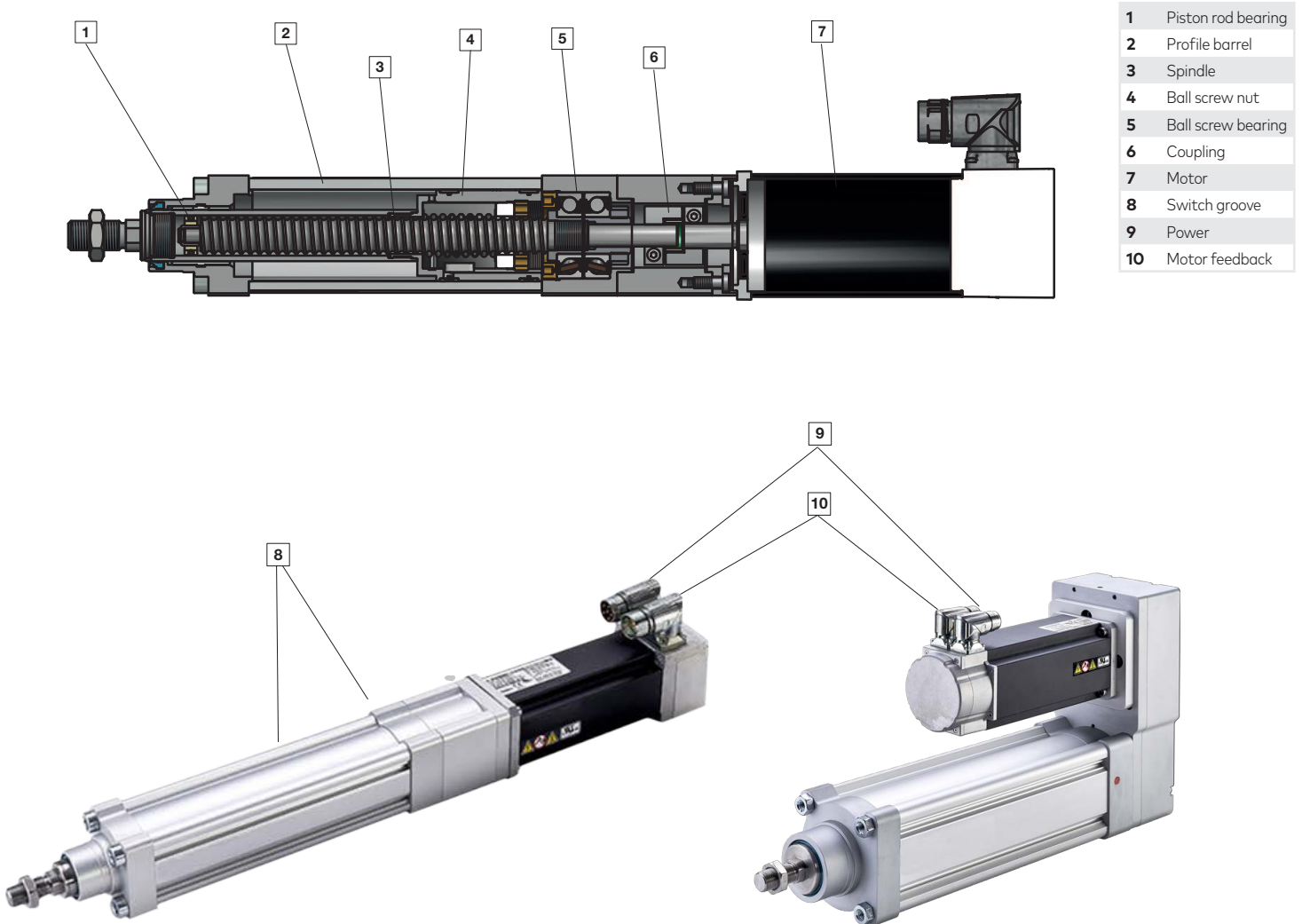


Golden Rules

The RAVEO RV 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.

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



Standard cylinder variants (IP40)

RV/809***/*/*/*/*/*/*/*/*/*/*/*/*

Size		Ball Screw	Variants				Motor Kit				Flange/Motor				Stroke (mm)	Piston rod extension (mm)
Sub. 1	Sub. 2	Sub. 3	Sub. 4	Sub. 5	Sub. 6	Sub. 7	Sub. 8	Sub. 9	Sub. 10	Sub. 11	Sub. 12	Sub. 13	Sub. 14	Sub. 15	Sub. 16	
Ø	Stroke	Ball Screw	Standard	Piston rod bellows	Piston rod extension	Internal thread	Motor Kit	Flange	Motor	Resolver	Absolute (multi turn)	Holding brake, resolver	Holding brake, absolute (multi turn)	Stroke	Piston rod extension	
Ø50	050	20x5	M	G	U	X	Actuator only, no coupling, no housing (see page 17)	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 (see page 20)	B			09, 12, 14, *					
		Axial kit (see page 20)					D	No motor, flange □67; ØN=60; ØM=75	X	1						
		Motor □67 (2,45 Nm)					J	A	B	M	N					
		Motor □67 (3,50 Nm)					N									
		Parallel kit - "North" (see page 21)					N	No motor, flange □67; ØN=60; ØM=75	X	1						
	Motor □67 (2,45 Nm)	J	A	B	M	N										
	Motor □67 (3,50 Nm)	N														
	Parallel kit - "East" (see page 21)	E	No motor, flange □67; ØN=60; ØM=75	X	1											
	Motor □67 (2,45 Nm)	J	A	B	M	N										
	Motor □67 (3,50 Nm)	N														
	Parallel kit - "South" (see page 21)	S	No motor, flange □67; ØN=60; ØM=75	X	1											
Motor □67 (2,45 Nm)	J	A	B	M	N											
Motor □67 (3,50 Nm)	N															
Parallel kit - "West" (see page 21)	W	No motor, flange □67; ØN=60; ØM=75	X	1												
Motor □67 (2,45 Nm)	J	A	B	M	N											
Motor □67 (3,50 Nm)	N															
Ø63	063	25x5	M	G	U	X	Actuator only, no coupling, no housing (see page 17)	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 (see page 20)	B			14, 18, 19, *					
		Axial kit (see page 20)					D	No motor, flange □67; ØN=60; ØM=75	X	1						
		No motor, flange □89; ØN=80; ØM=100					X	2								
		Motor □67 (2,45 Nm)					J	A	B	M	N					
		Motor □89 (6,90 Nm)					R									
	Parallel kit - "North" (see page 21)	N	No motor, flange □67; ØN=60; ØM=75	X	1											
	No motor, flange □89; ØN=80; ØM=100	X	2													
	Motor □67 (2,45 Nm)	J	A	B	M	N										
	Motor □89 (6,90 Nm)	R														
	Parallel kit - "East" (see page 21)	E	No motor, flange □67; ØN=60; ØM=75	X	1											
	No motor, flange □89; ØN=80; ØM=100	X	2													
Motor □67 (2,45 Nm)	J	A	B	M	N											
Motor □89 (6,90 Nm)	R															
Parallel kit - "South" (see page 21)	S	No motor, flange □67; ØN=60; ØM=75	X	1												
No motor, flange □89; ØN=80; ØM=100	X	2														
Motor □67 (2,45 Nm)	J	A	B	M	N											
Motor □89 (6,90 Nm)	R															
Parallel kit - "West" (see page 21)	W	No motor, flange □67; ØN=60; ØM=75	X	1												
No motor, flange □89; ØN=80; ØM=100	X	2														
Motor □67 (2,45 Nm)	J	A	B	M	N											
Motor □89 (6,90 Nm)	R															

Cylinder variants with IP65

RV/809 ****/****/****/****/****

Size		Ball Screw	Variants	Motor Kit	Flange/Motor				Stroke (mm)	Piston rod extension (mm)			
Sub. 1	Sub. 2	Sub. 3	Sub. 4	Sub. 5	Sub. 6	Sub. 7	Sub. 8	Sub. 9	Sub. 10				
			Standard with IP65 Piston rod bellows Piston rod extension Internal thread			Resolver Absolute (multi turn) Holding brake, resolver Holding brake, absolute (multi turn)							
Ø32	O33	12x5	05	Axial kit (see page 20)	D	Motor □55 (1,05 Nm)	E	A	B	M	N	100 ... 800	1 ... 200 (Use only for Variant "U" otherwise leave empty)
				Parallel kit - "North" (see page 21)	N								
				Parallel kit - "East" (see page 21)	E								
				Parallel kit - "South" (see page 21)	S								
		12x10	10	Parallel kit - "West" (see page 21)	W								
Ø40	O41	16x5	05	Axial kit (see page 20)	D	Motor □55 (1,05 Nm)	E	A	B	M	N	100 ... 800	1 ... 200 (Use only for Variant "U" otherwise leave empty)
				Parallel kit - "North" (see page 21)	N	Motor □67 (2,45 Nm)	J						
		16x10	10	Parallel kit - "East" (see page 21)	E	Motor □55 (1,05 Nm)	E						
				Parallel kit - "South" (see page 21)	S	Motor □67 (2,45 Nm)	J						
		16x16	16	Parallel kit - "West" (see page 21)	W	Motor □55 (1,05 Nm)	E						
						Motor □67 (2,45 Nm)	J						
Ø50	O51	20x05	05	Axial kit (see page 20)	D	Motor □67 (2,45 Nm)	J	A	B	M	N	100 ... 1000	1 ... 250 (Use only for Variant "U" otherwise leave empty)
				Parallel kit - "North" (see page 21)	N	Motor □67 (3,50 Nm)	N						
		20x10	10	Parallel kit - "East" (see page 21)	E	Motor □67 (2,45 Nm)	J						
				Parallel kit - "South" (see page 21)	S	Motor □67 (3,50 Nm)	N						
		20x20	20	Parallel kit - "West" (see page 21)	W	Motor □67 (2,45 Nm)	J						
						Motor □67 (3,50 Nm)	N						
Ø63	O64	25x05	05	Axial kit (see page 20)	D	Motor □67 (2,45 Nm)	J	A	B	M	N	100 ... 1200	1 ... 250 (Use only for Variant "U" otherwise leave empty)
				Parallel kit - "North" (see page 21)	N	Motor □89 (6,90 Nm)	R						
		25x10	10	Parallel kit - "East" (see page 21)	E	Motor □67 (2,45 Nm)	J						
				Parallel kit - "South" (see page 21)	S	Motor □89 (6,90 Nm)	R						
		25x25	25	Parallel kit - "West" (see page 21)	W	Motor □67 (2,45 Nm)	J						
						Motor □89 (6,90 Nm)	R						

* For more versions please contact the technical service.

Cylinder variants with IP65

RV/809****/****/****/****/****

Size		Ball Screw	Variants	Motor Kit	Flange/Motor				Stroke (mm)	Piston rod extension (mm)			
Sub. 1	Sub. 2	Sub. 3	Sub. 4	Sub. 5	Sub. 6	Sub. 7	Sub. 8						
			Standard with IP65 Piston rod bellows Piston rod extension Internal thread		Resolver Absolute (multi turn) Holding brake, resolver Holding brake, absolute (multi turn)								
Ø80	081	32x5	M G U X	Axial kit (see page 20)	D	Motor □67 (3,50 Nm) Motor □89 (6,90 Nm)	N R N R	100 ... 1500	1 ... 350 (Use only for Variant "U" otherwise leave empty)				
		32x10		Parallel kit - "North" (see page 21)	N	Motor □67 (3,50 Nm) Motor □89 (6,90 Nm)	N R						
		32x20		Parallel kit - "East" (see page 21)	E	Motor □67 (3,50 Nm) Motor □89 (6,90 Nm)	N R			A	B	M	N
		32x32		Parallel kit - "South" (see page 21)	S	Motor □67 (3,50 Nm) Motor □89 (6,90 Nm)	N R						
				Parallel kit - "West" (see page 21)	W	Motor □67 (3,50 Nm) Motor □89 (6,90 Nm)	N R						
Ø100	101	40x04	M G U X	Axial kit (see page 20)	D	Motor □89 (6,90 Nm) Motor □115 (10,50 Nm)	R W	100 ... 1500	1 ... 350 (Use only for Variant "U" otherwise leave empty)				
		40x10		Parallel kit - "North" (see page 21)	N	Motor □89 (6,90 Nm) Motor □115 (10,50 Nm)	R W						
		40x20		Parallel kit - "East" (see page 21)	E	Motor □89 (6,90 Nm) Motor □115 (10,50 Nm)	R W			A	B	M	N
		40x40		Parallel kit - "South" (see page 21)	S	Motor □89 (6,90 Nm) Motor □115 (10,50 Nm)	R W						
				Parallel kit - "West" (see page 21)	W	Motor □89 (6,90 Nm) Motor □115 (10,50 Nm)	R R						

* For more versions please contact the technical service.

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 RAVEO RV 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 of 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} .

$$F_{tot} = F_I + F_{fr} + F_{gr} + F_{const}$$

The forces can be calculated as follows:

$$F_I = -(m_{mov,act} + m_{load}) \cdot a$$

$$F_{fr} = -\text{sign}(\Delta x) \cdot \mu \cdot |\cos(\varphi) \cdot (m_{mov,act} + m_{load}) \cdot g|$$

$$F_{gr} = \sin(\varphi) \cdot (m_{mov,act} + m_{load}) \cdot g$$

a	Acceleration/deceleration	m/s^2
$m_{mov,act}$	Moving mass of the actuator	kg
m_{load}	Load mass applied on actuator	kg
Δx	Stroke of each movement	m
φ	Direction of the movement	°
μ	Friction coefficient	-
g	Gravitational acceleration	m/s^2

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

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

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 defining 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.

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

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.

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

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

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.

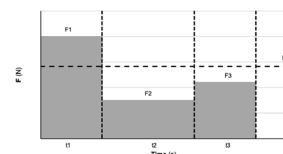
$$T_{rms} = \sqrt{\sum \left(\frac{F_{tot,step} \cdot P_{spindle}}{2\pi \cdot 0.85} \right)^2 \cdot \frac{t_{step}}{t_{tot}}}$$

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

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.

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



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

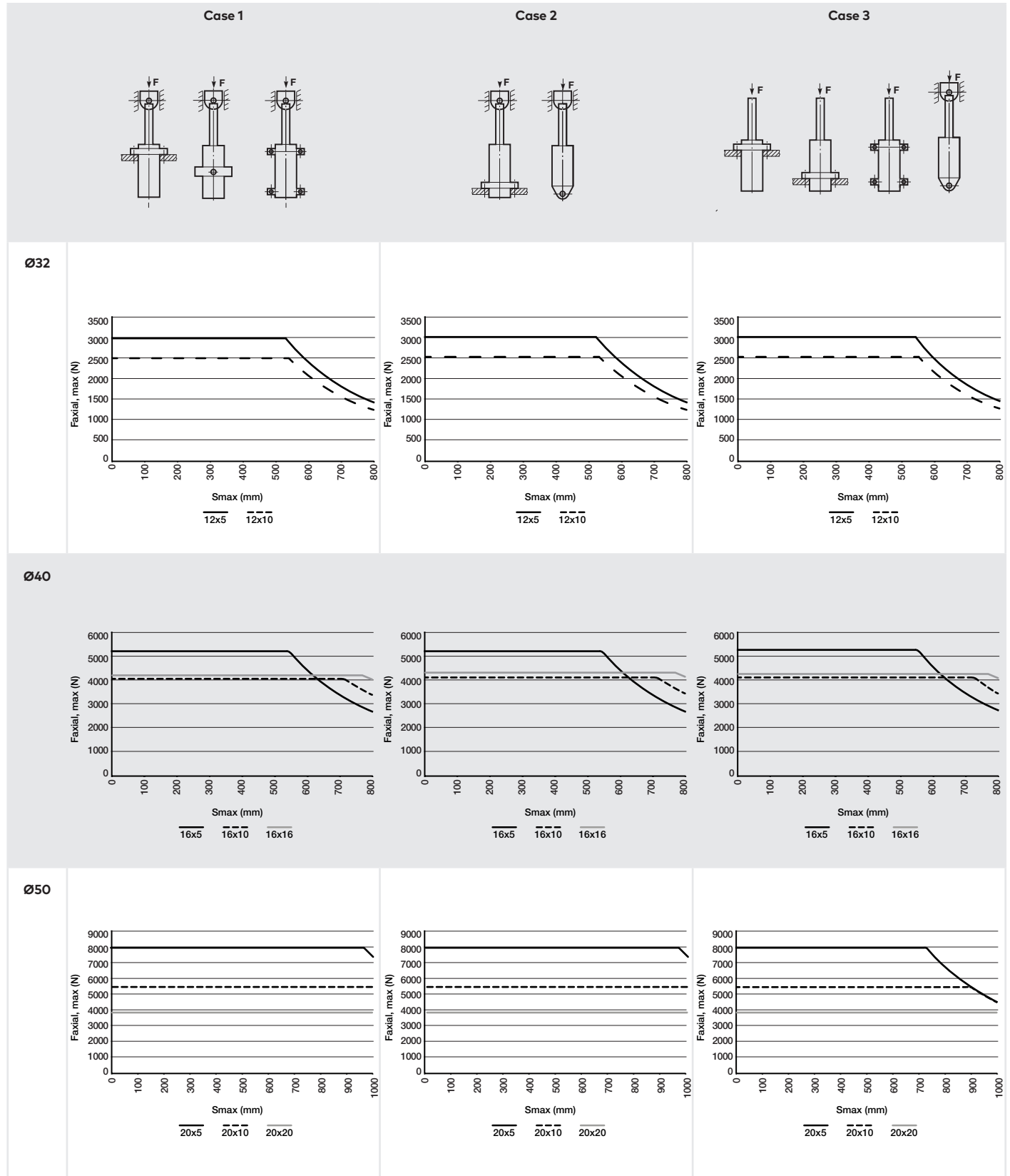
$$L = \left(\frac{C}{F_m} \right)^3 \cdot 10^6$$

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

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

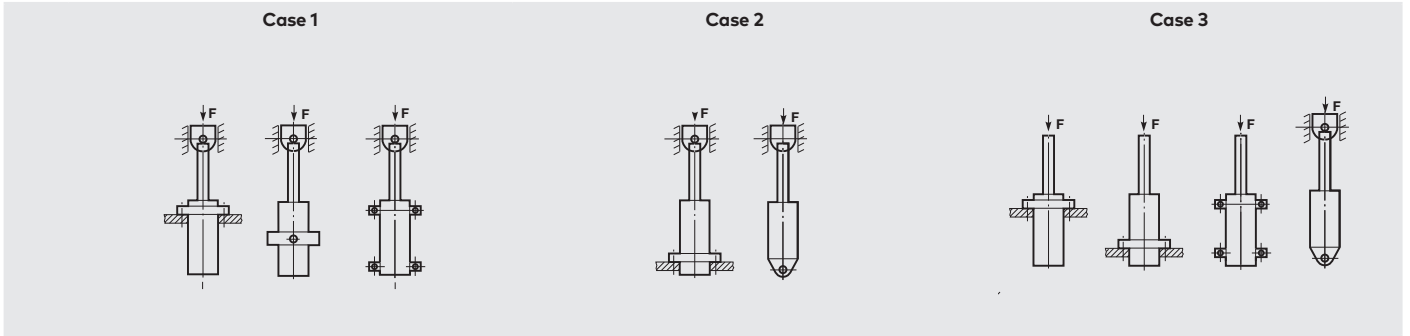
Cylinder variants

Permissible axial forces F_{max}

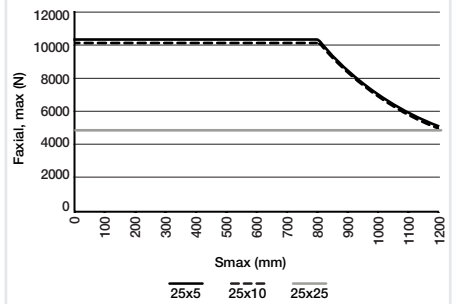
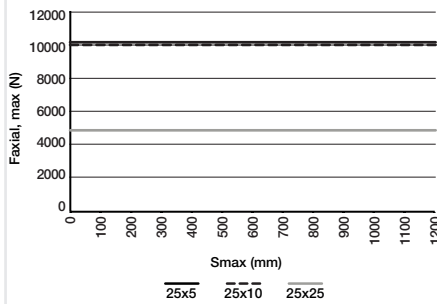
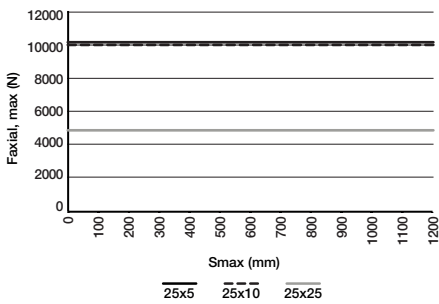


Cylinder variants

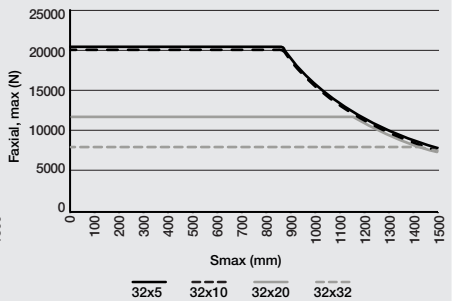
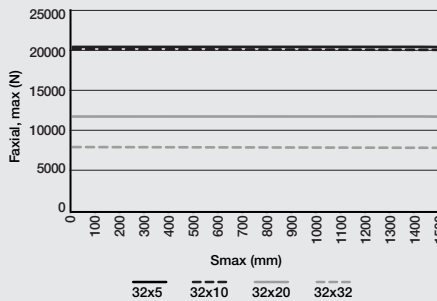
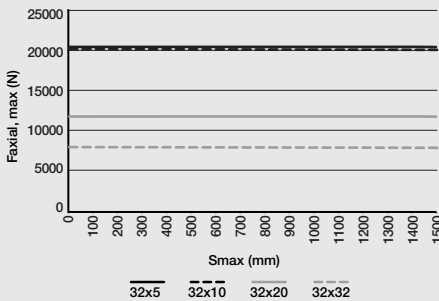
Permissible axial forces F_{max}



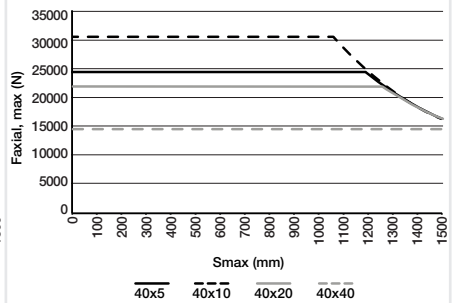
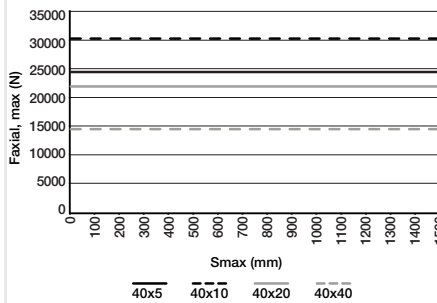
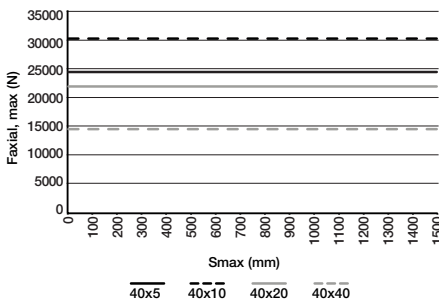
Ø63



Ø80

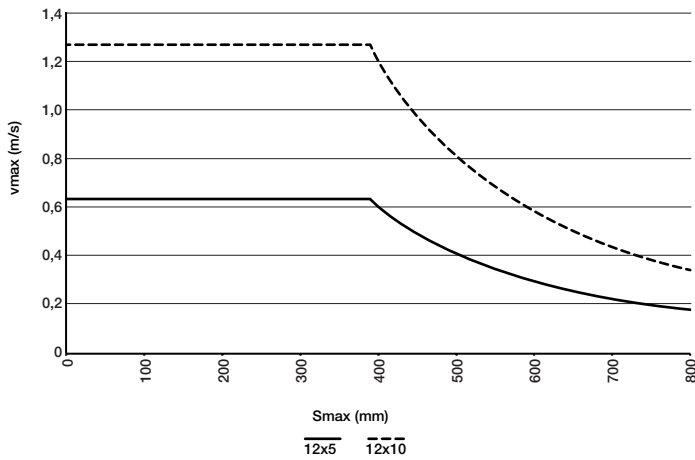


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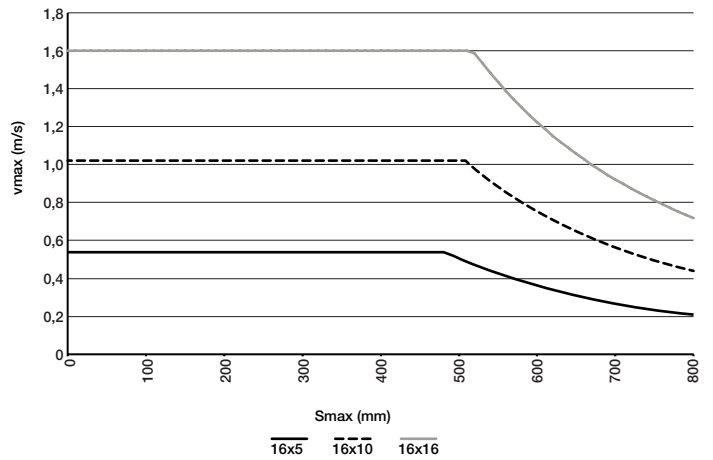


Permissible Speeds

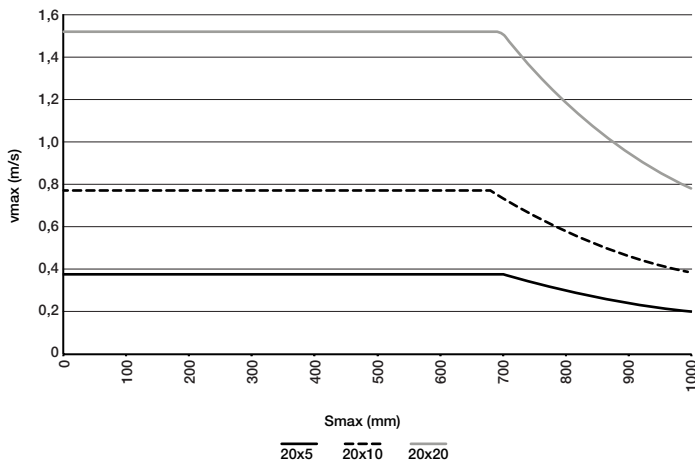
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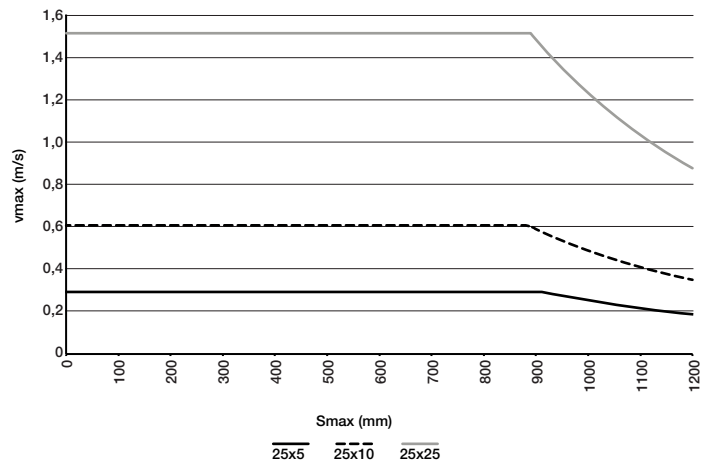
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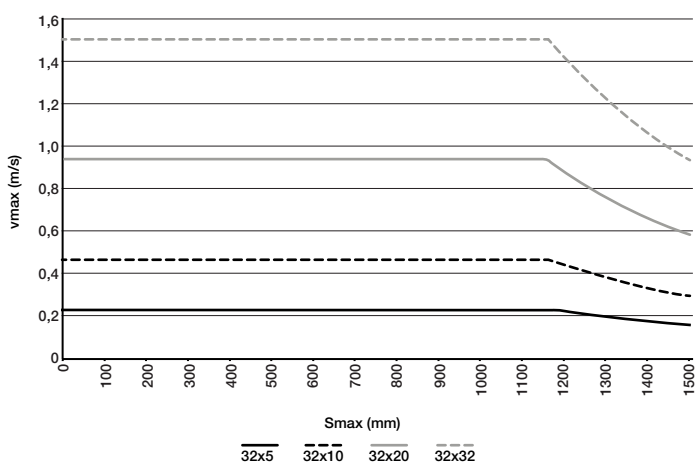
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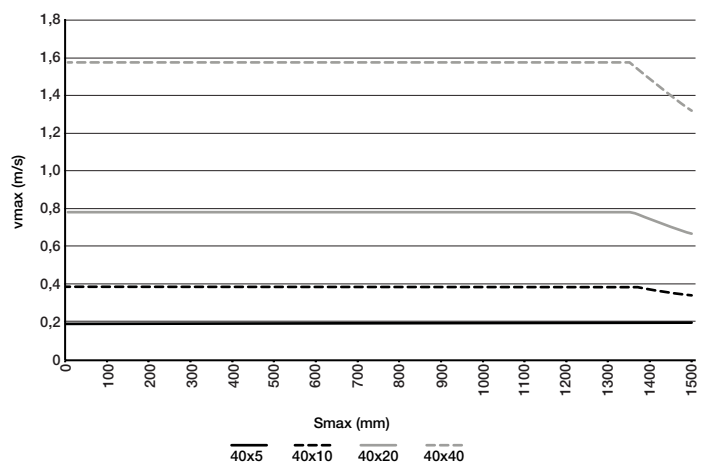
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Ø80

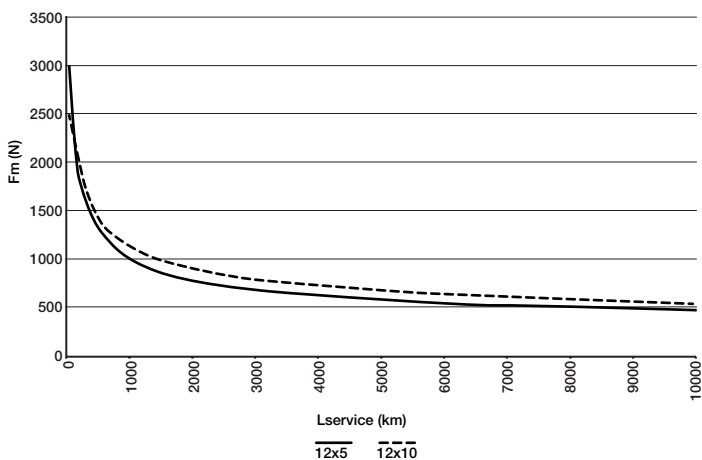


Ø100

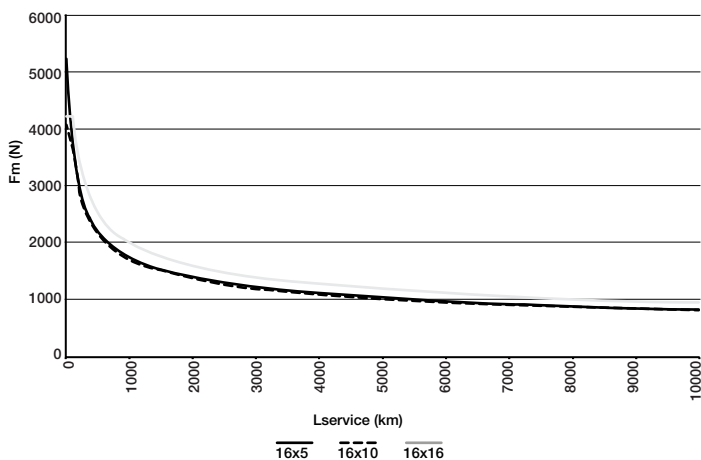


Force Life Time

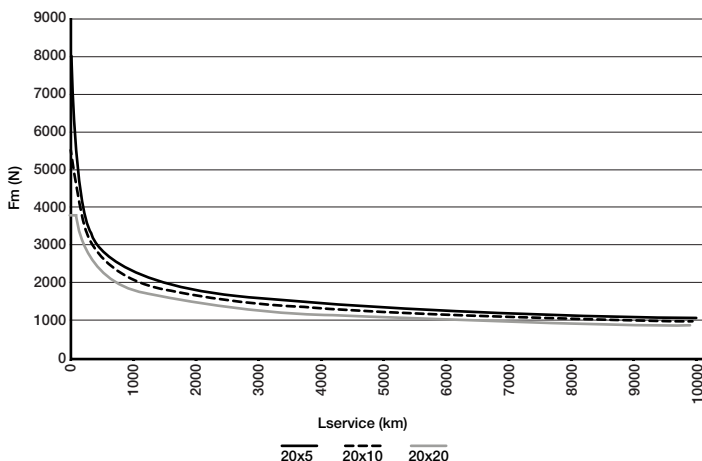
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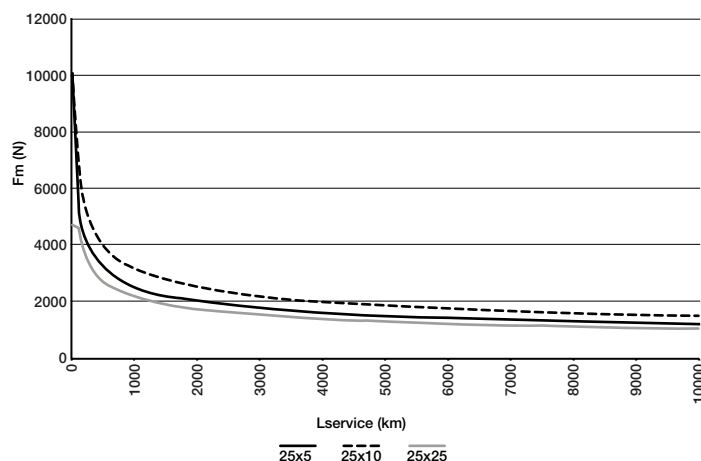
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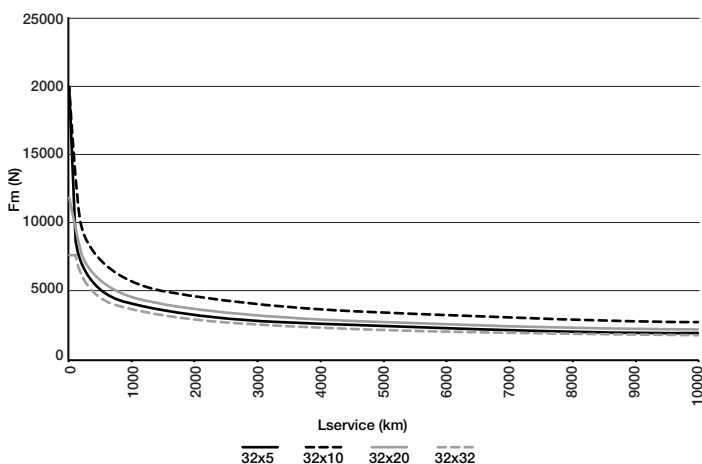
Ø50



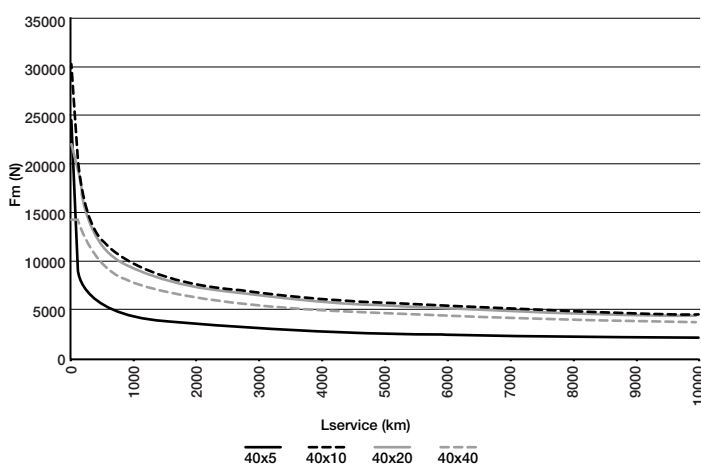
Ø63



Ø80



Ø100



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)	$F_1 = (95 \text{ kg} + 5 \text{ kg}) \times 10 \text{ m/s}^2 =$	1000 N
b)	Weight of the load to be lifted (outstroke)	$F_2 = 5 \text{ kg} \times 10 \text{ m/s}^2 =$	50 N
c)	Required stroke length	s	850 mm
d)	Load case	\mathcal{L} Non-guided	3
e)	Ambient temperature	T'_{max}	35 °C
f)	Material requirements		keine
g)	Maximum speed (instroke)	$v_1 = \frac{\Delta x}{\frac{1}{3} t_{ein}} =$	0,142 m/s
h)	Maximum speed (outstroke)	$v_2 = \frac{\Delta x}{\frac{1}{3} t_{aus}} =$	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	\mathcal{L}_{zykl}	1.000.000
l)	Life expectancy in km	$\mathcal{L}_{km} = 1.000.000 \times (850 \text{ mm} / 1.000.000 \text{ km/mm}) \times 2$	1.700 km

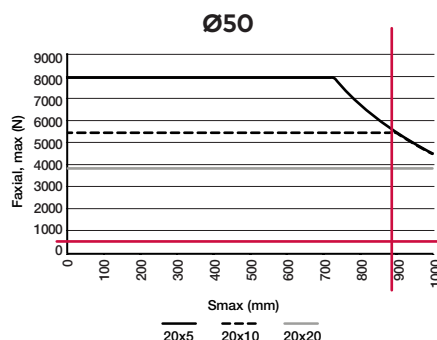
Step 2: Selection of suitable actuators based on the working stroke

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				+ 0,07				
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/s ²)	10																			
Max. angle of rotation at the piston rod (°)	0,65°		0,6°			0,5°			0,4°			0,3°				0,25°				

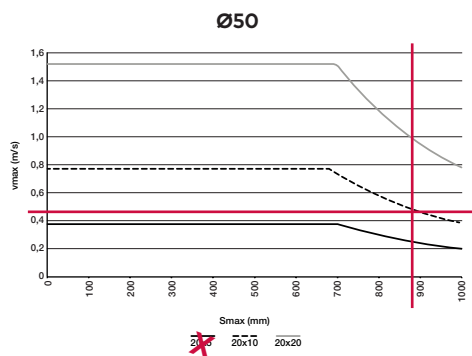
Step 3: Selection of suitable actuators based on the maximum permissible forces

The maximum permissible force depends on the order stroke and can be taken from the diagrams on pages 9 to 10 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.



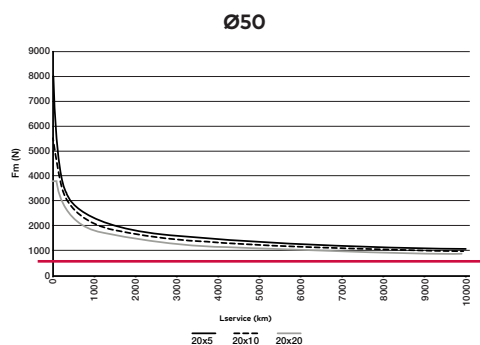
Step 4: Selection of suitable actuators based on the maximum permissible speed

The maximum permissible speed depends on the order stroke and can be taken from the diagrams on page 11 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 F_m can be calculated using the formula on page 8. 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:

$$\begin{aligned} \text{Order stroke} &= \text{working stroke} + 2 \times 20 \text{ mm} \\ &= 850 \text{ mm} + 40 \text{ mm} \\ &= \mathbf{890 \text{ mm}} \end{aligned}$$

Step 7: Check all remaining parameters

- e) temperature requirement of $T_{max} = 35 \text{ °C}$ is met
- h) there are no specific requirements for the material

Result:

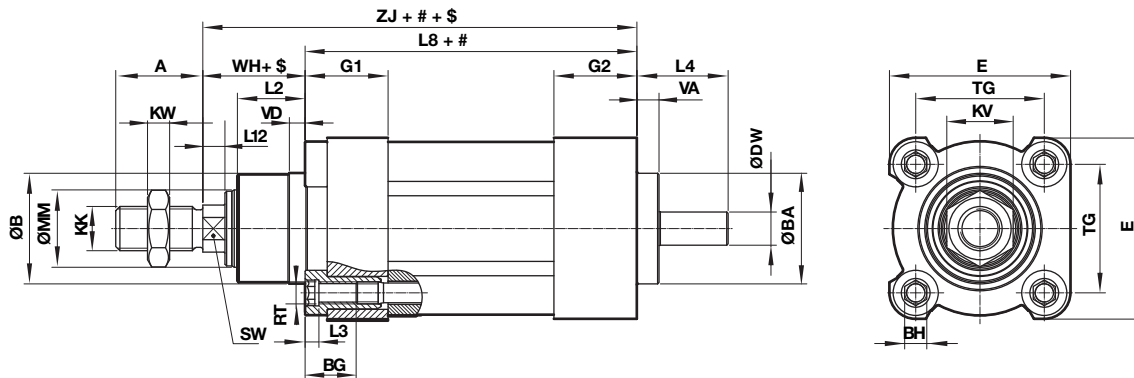
RV/809050/10M/890 is the chosen electromechanical actuator, because it meets all requirements.

Basic dimensions

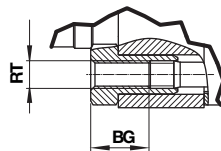
RV/809000/M/AXX, RV/809000/**U/AXX**

Actuator without motor, without coupling, without housing

Dimensions in mm
Projection/First angle



Ø80 & Ø100



= 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	RV/809032/05*/AXX
								RV/809032/10*/AXX
								RV/809040/05*/AXX
40	M6	13	38 ±0,5	7	6	30 ±1,4	160,5	RV/809040/10*/AXX
								RV/809040/16*/AXX
								RV/809050/05*/AXX
50	M8	17	46,5 ±0,6	8	6	37 ±1,4	168	RV/809050/10*/AXX
								RV/809050/20*/AXX
								RV/809063/05*/AXX
63	M8	17	56,5 ±0,7	8	6	37 ±1,8	197	RV/809063/10*/AXX
								RV/809063/25*/AXX
								RV/809080/05*/AXX
80	M10	22	72 ±0,7	9	6	46 ±1,8	230,5	RV/809080/10*/AXX
								RV/809080/20*/AXX
								RV/809080/32*/AXX
100	M10	22	89 ±0,7	9	6	51 ±1,8	265,5	RV/809100/05*/AXX
								RV/809100/10*/AXX
								RV/809100/20*/AXX
								RV/809100/40*/AXX

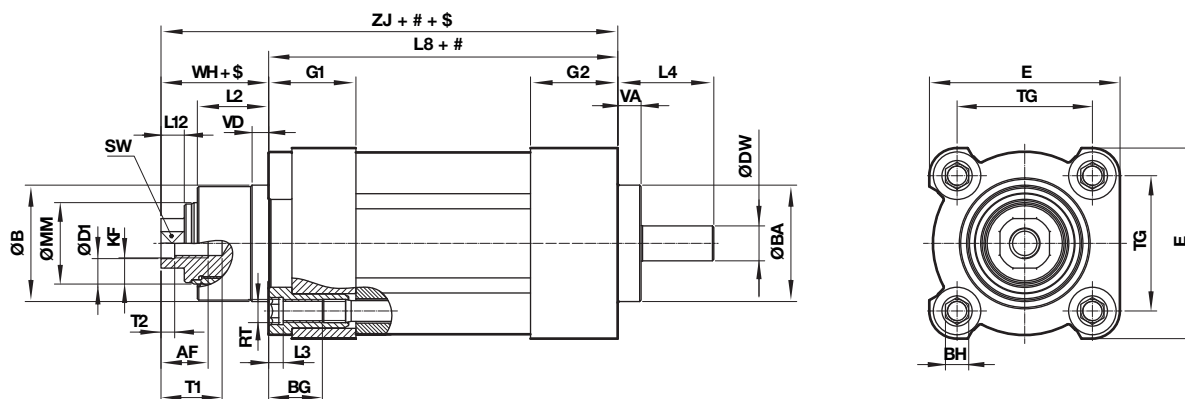
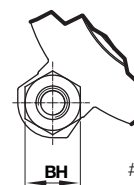
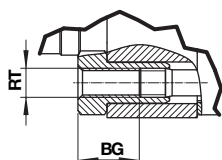


Weights, moving mass, inertia
RV/809000/M/AXX, RV/809000/**U/AXX**
Actuator without motor, without coupling, without housing

Ø	32		40				50	
	5	10	5	10	16	5	10	20
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			
	5	10	25	5	10	20	32	5	10	20	40
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

Basic dimensions
RV/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	RV/809032/05X/AXX
										RV/809032/10X/AXX
										RV/809040/05X/AXX
40	M6	13	16	3,3	38 ± 0,5	7	6	30 ± 1,4	160,5	RV/809040/10X/AXX
										RV/809040/16X/AXX
										RV/809050/05X/AXX
50	M8	17	21	4,7	46,5 ± 0,6	8	6	37 ± 1,4	168	RV/809050/10X/AXX
										RV/809050/20X/AXX
										RV/809063/05X/AXX
63	M8	17	21	4,7	56,5 ± 0,7	8	6	37 ± 1,8	197	RV/809063/10X/AXX
										RV/809063/25X/AXX
										RV/809080/05X/AXX
80	M10	22	25	6,1	72 ± 0,7	9	6	46 ± 1,8	230,5	RV/809080/10X/AXX
										RV/809080/20X/AXX
										RV/809080/32X/AXX
										RV/809100/05X/AXX
100	M10	22	25	6,1	89 ± 0,7	9	6	51 ± 1,8	265,5	RV/809100/10X/AXX
										RV/809100/20X/AXX
										RV/809100/40X/AXX

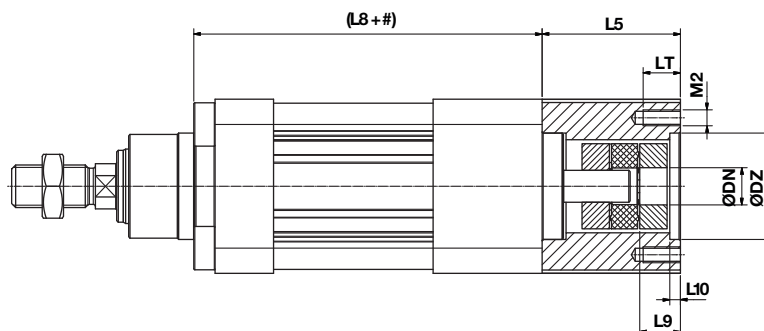
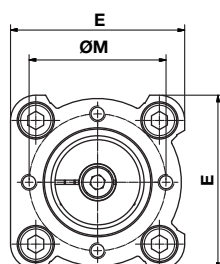


Basic dimensions

RV/809000/***/B**

Actuator with coupling and housing for customer individual motor flange

Dimensions in mm
Projection/First angle



= Stroke

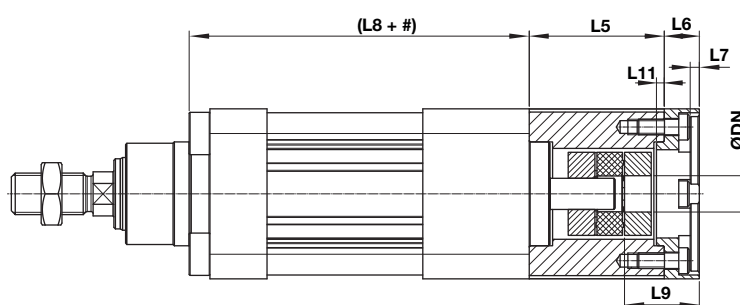
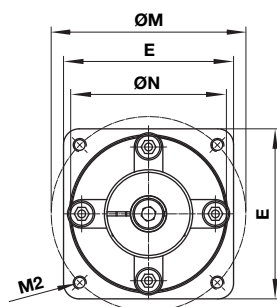
Ø	ØDN H7*	ØDZ H7	E	L5	L9	L10	LT	M2	ØM	Weight motor mounting kit (kg)	Model
32	7, 8, 9	30	47	39	11	3	10	M4	36	0,20	RV/809032/***/B**
40	9, 12, 14	37	55	42	10,3	3	10	M4	44	0,28	RV/809040/***/B**
50	9, 12, 14	40	65,5	52	15,3	4	14	M6	51,5	0,52	RV/809050/***/B**
63	14, 18, 19	50	74,5	61	17	3	14	M6	60	0,75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

* For more versions please contact technical service.

Basic dimensions

RV/809000/***/DX*

Actuator with axial motor mounting kit



= stroke

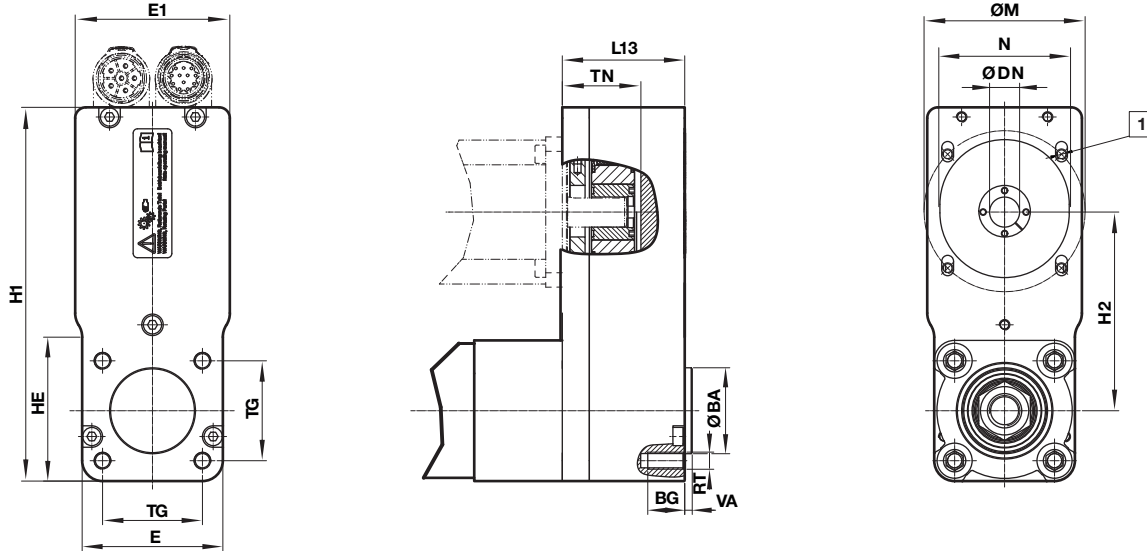
Ø	ØDN H7	E	L5	L6	L7	L8	L9	L11	M2	ØN G7	ØM	Weight motor mounting kit (kg)	Model
32	8	47	39	11,5	3	107±0,4	22	2	M4	30	46	0,25	RV/809032/***/DX1
32	9	53	39	9	3	107±0,4	19,5	2	M5	40	63	0,25	RV/809032/***/DX2
40	9	55	42	10	3	130,5±0,7	20,3	2	M5	40	63	0,34	RV/809040/***/DX1
40	14	65,5	42	18,5	3,5	130,5±0,7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



Basic dimensions

RV/809000/*/NX*, RV/809000/***/EX*, RV/809000/***/SX*, RV/809000/***/WX***
Actuator with parallel motor mounting kit

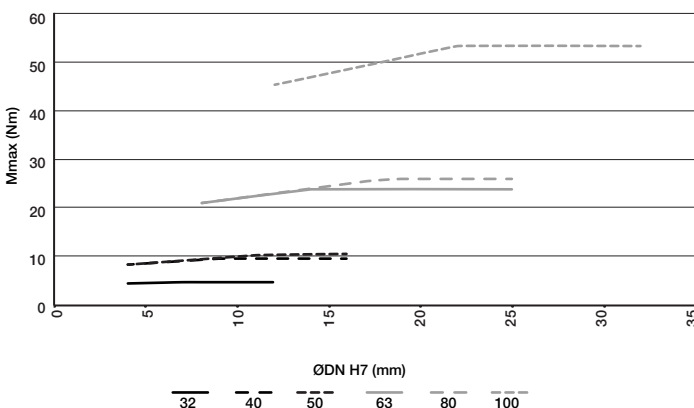
Dimensions in mm
 Projection/First angle



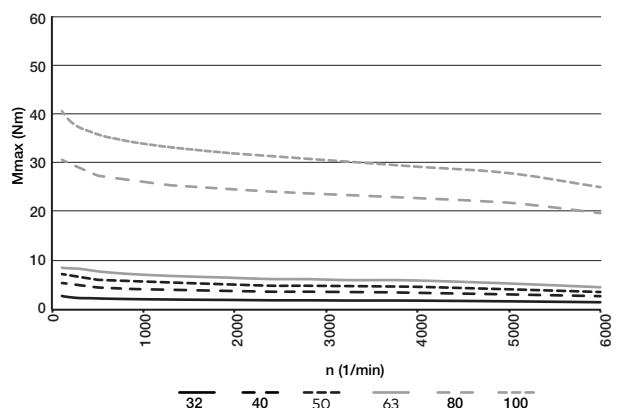
1 M2 - T2 deep

Ø	ØBA d11	BG min	DN	E	E1	H1	H2	HE	L13	M2	ØM	N	RT	T2	TG	TN	VA	Weight (kg)	Model
32	30	16	8	47	56	130,6	67,5	48	47	M4	46	30	M6	11	32,5 ±0,5	max. 28	3,5	0,75	RV/809032/***/X1
32	30	16	9	47	56	130,6	67,5	48	47	M5	63	40	M6	11	32,5 ±0,5	20 ±0,2	3,5	0,76	RV/809032/***/X2
40	35	16	9	55	72	147,6	72,5	55	53	M5	63	40	M6	11	38 ±0,5	max.37	3,5	1,20	RV/809040/***/X1
40	35	16	14	55	72	147,6	72,5	55	53	M5	75	60	M6	11	38 ±0,5	30 ±0,2	3,5	1,15	RV/809040/***/X2
50	40	16	14	65,5	72	174	92,5	67	57,5	M5	75	60	M8	14	46,5 ±0,6	max. 36	3,5	1,73	RV/809050/***/X1
63	45	16	14	74,5	89	193	95	76	57,5	M5	75	60	M8	15	56,5 ±0,7	max. 42	3,5	2,10	RV/809063/***/X1
63	45	16	19	74,5	89	193	95	76	57,5	M6	100	80	M8	15	56,5 ±0,7	max. 42	3,5	2,20	RV/809063/***/X2
80	45	17	14	95	95	225,5	116	-	63,5	M5	75	60	M10	16	72 ±0,7	max. 43	3,5	3,20	RV/809080/***/X1
80	45	17	19	95	95	225,5	116	-	63,5	M6	100	80	M10	16	72 ±0,7	max. 43	3,5	3,25	RV/809080/***/X2
100	55	17	19	113	125	279	144	120	68,5	M6	100	80	M10	19	89 ±0,7	max. 51	3,5	5,20	RV/809100/***/X1
100	55	17	24	113	125	279	144	120	68,5	M8	130	110	M10	19	89 ±0,7	max. 51	3,5	5,64	RV/809100/***/X2

Coupling Graph

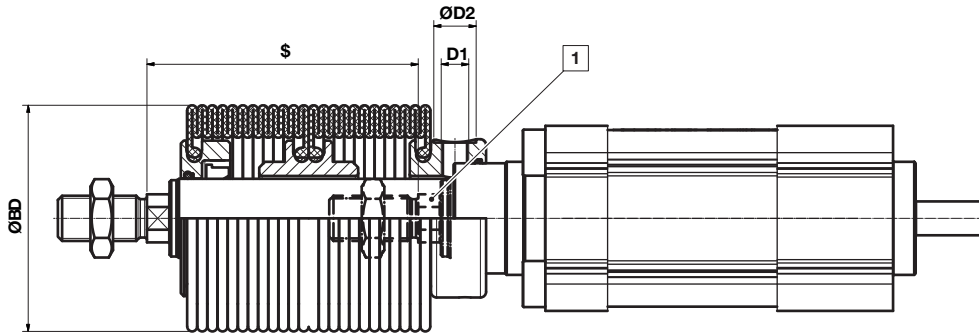


Toothbelt graph



Basic dimensions
RV/809000/G**
Actuator variant with piston rod bellows

Dimensions in mm
 Projection/First angle

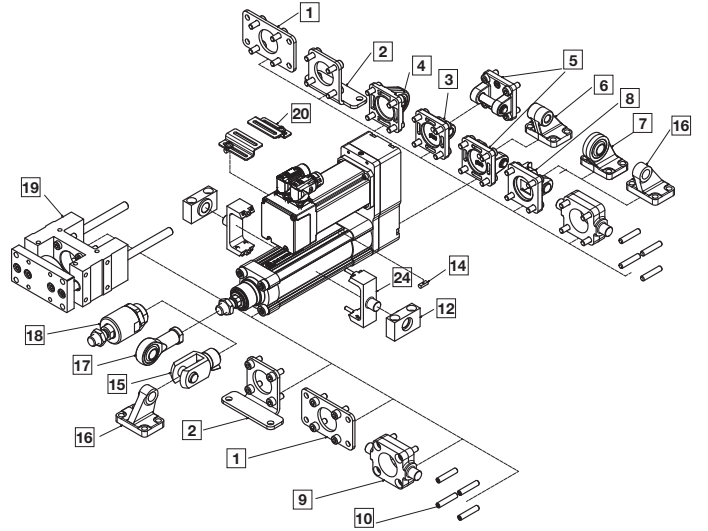
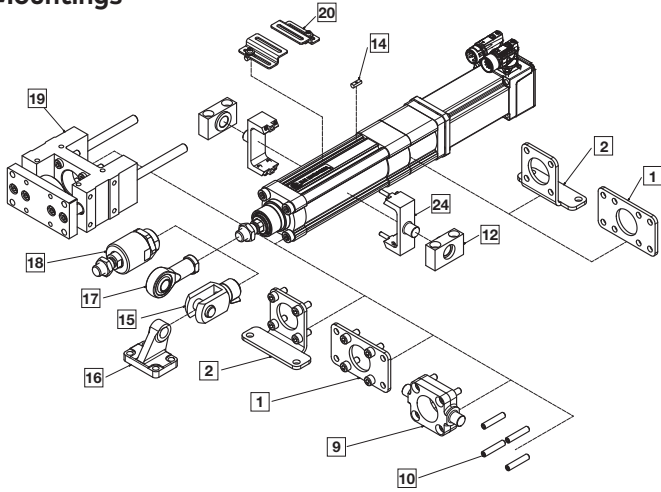


\$ = piston rod extension

1 Piston rod without bellows

Ø	ØBD	D1	ØD2	Piston rod ext. 1. bellows	Piston rod ext. further bellows	Max. stroke per bellows	Weight first bellow (kg)	Weight for further bellows (kg)	Typ
32	63	M5	9	40	32	145	0,13	0,08	RV/809032/**G/AXX
40	80	G 1/8	15	52	43	250	0,29	0,22	RV/809040/**G/AXX
50	80	G 1/8	15	53	43	250	0,29	0,21	RV/809050/**G/AXX
63	80	G 1/8	15	53	43	250	0,30	0,18	RV/809063/**G/AXX
80	116	G 1/4	19	69	60	350	0,71	0,50	RV/809080/**G/AXX
100	116	G 1/4	19	69	60	350	0,73	0,43	RV/809100/**G/AXX

Mountings



Model	A
	10
Ø	
32	QM/8032/35
40	QM/8032/35
50	QM/8050/35
63	QM/8050/35
80	QM/8080/35
100	QM/8080/35

Model	AK
	18
QM/8025/38	
QM/8040/38	
QM/8050/38	
QM/8050/38	
QM/8080/38	
QM/8080/38	

Model	B, G
	1
QE/809032/22	
QE/809040/22	
QE/809050/22	
QE/809063/22	
QE/809080/22	
QE/809100/22	

Model	C
	2
QE/809032/21	
QE/809040/21	
QE/809050/21	
QE/809063/21	
QE/809080/21	
QE/809100/21	

Model	D
	5
QA/8032/23	
QA/8040/23	
QA/8050/23	
QA/8063/23	
QA/8080/23	
QA/8100/23	

Model	D2
	8
QA/8032/42	
QA/8040/42	
QA/8050/42	
QA/8063/42	
QA/8080/42	
QA/8100/42	

Model	F
	15
Ø	
32	QM/8025/25
40	QM/8040/25
50	QM/8050/25
63	QM/8050/25
80	QM/8080/25
100	QM/8080/25

Model	FH
	9
QA/8032/34	
QA/8040/34	
QA/8050/34	
QA/8063/34	
-	
-	

Model	UH
	24
PQA/802032/40	
PQA/802040/40	
PQA/802050/40	
PQA/802063/40	
PQA/802080/40	
PQA/802100/40	

Model	S
	12
QA/8032/41	
QA/8040/41	
QA/8040/41	
QA/8063/41	
QA/8063/41	
QA/8100/41	

Model	SW
	6
M/P19493	
M/P19494	
M/P19495	
M/P19496	
M/P19497	
M/P19498	

Model	UF
	17
QM/8025/32	
QM/8040/32	
QM/8050/32	
QM/8050/32	
QM/8080/32	
QM/8080/32	

Model	UR
	4
Ø	
32	QA/8032/33
40	QA/8040/33
50	QA/8050/33
63	QA/8063/33
80	QA/8080/33
100	QA/8100/33

Model	R
	3
QA/8032/27	
QA/8040/27	
QA/8050/27	
QA/8063/27	
QA/8080/27	
QA/8100/27	

Model	SS
	16
M/P19931	
M/P19932	
M/P19933	
M/P19934	
M/P19935	
M/P19936	

Model	US
	7
M/P40310	
M/P40311	
M/P40312	
M/P40313	
M/P40314	
M/P40315	

Model	Nutstein
	14
M/P72816	
M/P72816	
M/P72816	
M/P72816	
M/P72816	
M/P72816	

Model	Flanschplatte:
	20
PQA/802032/22/54	
PQA/802032/22/54	
PQA/802050/22/54	
PQA/802050/22/54	
PQA/802080/22/54	
PQA/802080/22/54	

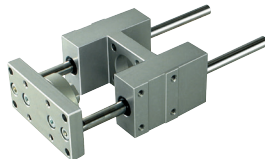
Pos.	Style	Standard
1	B, G	Galvanised steel
2	C	Galvanised steel
3	R	Die-cast aluminium
4	UR	Die-cast aluminium Inner ring: steel, Outer ring: brass
5	D	Die-cast aluminium Bolt: Galvanised steel (martensitic) Circlip: Galvanised steel
6	SW	Die-cast aluminium
7	US	Galvanised cast iron Inner ring: steel, 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
19	51, 61, 81, 85	Anodised aluminium
24	UH	Anodised aluminium

Guide blocks

Model Guide blocks - plain bearings

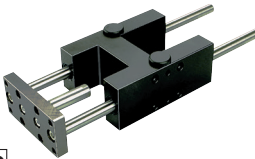


19

Ø

32	QA/8032/51/*
40	QA/8040/51/*
50	QA/8050/51/*
63	QA/8063/51/*

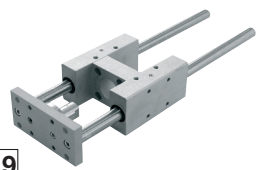
Model Guide blocks - roller bearings



19

QA/8032/61/*
QA/8040/61/*
QA/8050/61/*
QA/8063/61/*

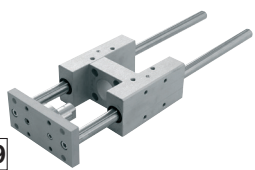
Model Guide blocks - plain bearings, long couplingm



19

QA/8032/81/*
QA/8040/81/*
QA/8050/81/*
QA/8063/81/*

Model Guide blocks - plain bearings, short coupling




19

QA/8032/85/*
QA/8040/85/*
QA/8050/85/*
QA/8063/85/*

Magnetically operated switches


Model M/50/**



Ø

32
40
50
63
80
100

Model Groove cover

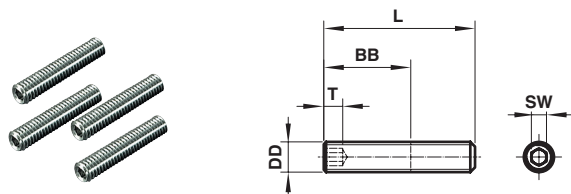


M/P72725/1000
M/P72725/1000
M/P72725/1000
M/P72725/1000
M/P72725/1000
M/P72725/1000

Mountings

Front or rear stud mounting A

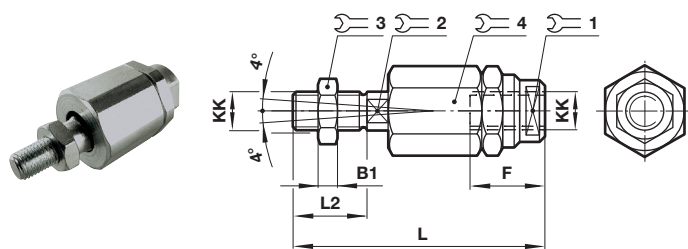
Dimensions in mm
Projection/First angle



∅	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

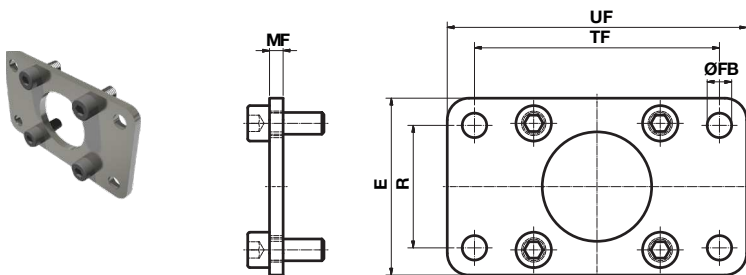
AK



∅	KK	B1	F	L	L2	SW				(kg)	F _{max} (N)	Model (AK)
						1	2	3	4			
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 1552, type MF1 and MF2



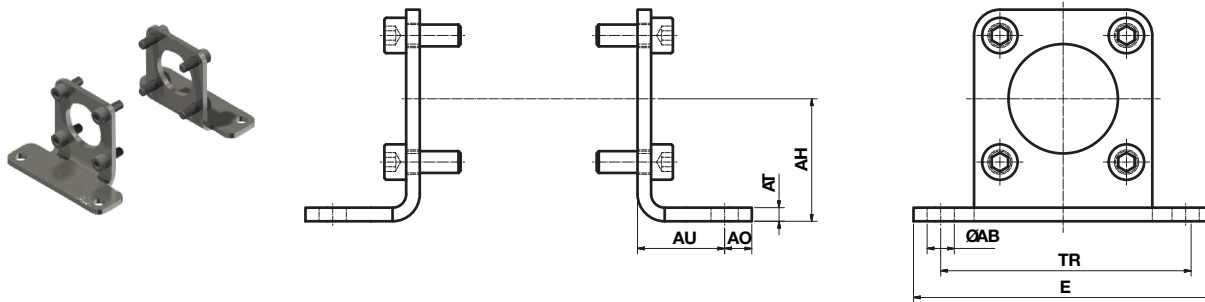
∅	E	ØFB	MF	R	TF	UF	(kg)	F _{max} (N)	Model (B, G)
32	50	7	4	32	64	80	0,24	1.600	QE/809032/22
40	55	9	4	36	72	90	0,28	2.500	QE/809040/22
50	65	9	5	45	90	110	0,54	3.900	QE/809050/22
63	75	9	5	50	100	125	0,66	6.200	QE/809063/22
80	100	12	6	63	126	154	1,3	10.000	QE/809080/22
100	120	14	6	75	150	186	1,82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



Foot mounting C

Based on ISO 15552, type MS1

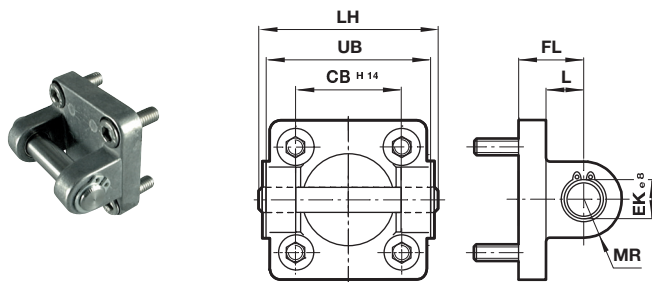
Dimensions in mm
Projection/First angle



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

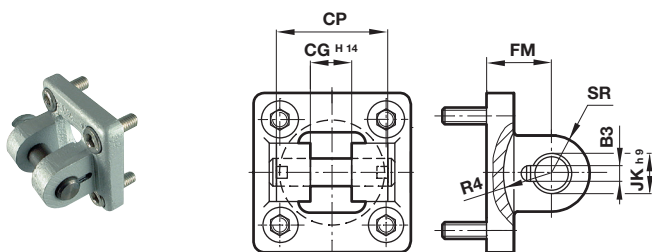
Conforms to ISO 15552, type MP2



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

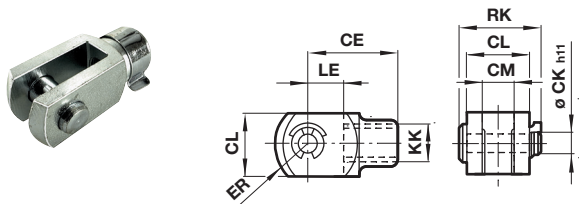


Ø	CG H14	CP	B3	ØJK h9	FM	SR	R4	(kg)	F _{max} (N)	Model (D2)
32	14	34	3,3	10	22	11	17	0,20	1.600	QA/8032/42
40	16	40	4,3	12	25	12	20	0,23	2.500	QA/8040/42
50	21	45	4,3	16	27	14,5	22	0,36	3.900	QA/8050/42
63	21	51	4,3	16	32	18	25	0,55	6.200	QA/8063/42
80	25	65	4,3	20	36	22	30	0,90	10.000	QA/8080/42
100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



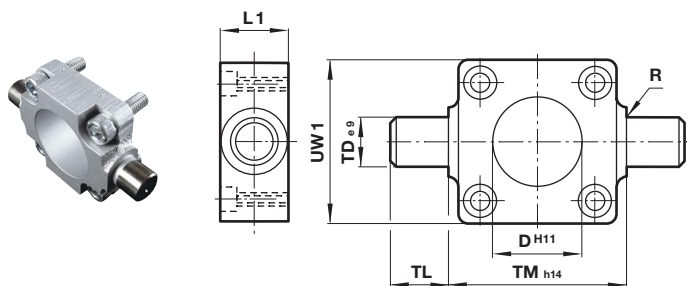
Piston rod clevis F
Conforms to DIN ISO 8140

Dimensions in mm
Projection/First angle



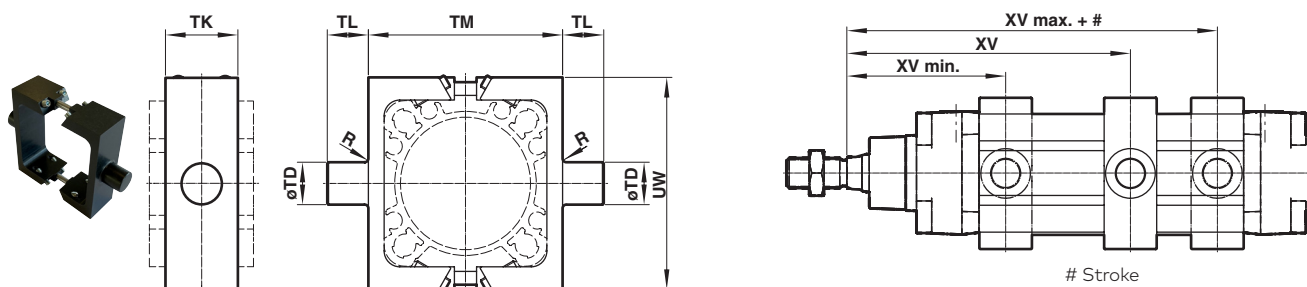
Ø	KK	CE	øCK h11	CL	CM	ER	LE	RK	(kg)	F _{max} (N)	Model (F)
32	M10 x 1,25	40	10	20	10	16	20	27,5	0,09	1.600	QM/8025/25
40	M12 x 1,25	48	12	24	12	19	24	33,5	0,13	2.500	QM/8040/25
50/63	M16 x 1,5	64	16	32	16	25	32	42	0,33	6.200	QM/8050/25
80/100	M20 x 1,5	80	20	40	20	32	40	51	0,67	15.700	QM/8080/25

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



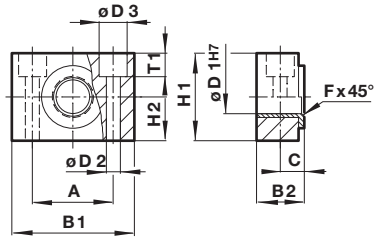
Ø	R	øTD e9	TK max.	TL h14	TM h14	UW	XV min	XV max + #	(kg)	Torque (Nm)	F _{max} (N)	Model (UH)
32	1	12	25	12	50	58	65,5	88,5	0,06	0,8	1.600	PQA/802032/40
40	1,6	16	28	16	63	65	71	109,5	0,11	0,8	2.500	PQA/802040/40
50	1,6	16	28	16	75	80	81	113	0,16	3,0	3.900	PQA/802050/40
63	1,6	20	36	20	90	96	85	130	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 should be done by RAVEO, 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.



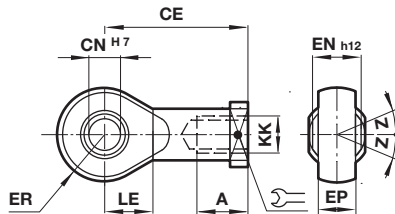
Trunnion support S
Conforms to ISO 15552, type AT4

Dimensions in mm
Projection/First angle



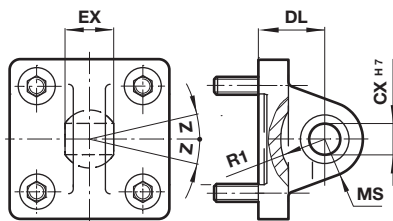
\varnothing	A	B1	B2	C	$\varnothing D1 H7$	$\varnothing D2$	$\varnothing D3$	F x 45 °	H1	H2	T1	(kg)	Model (S)
32	32	46	18	10,5	12	6,6	11	1	30	15	6,8	0,10	QA/8032/41
40/50	36	55	21	12	16	9	15	1,6	36	18	9	0,14	QA/8040/41
63/80	42	65	23	13	20	11	18	1,6	40	20	11	0,18	QA/8063/41
100	50	75	28,5	16,5	25	14	20	2	50	25	13	0,34	QA/8100/41

Universal piston rod eye UF
Conforms to DIN ISO 8139



\varnothing	KK	A	CE	$\varnothing CN H7$	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

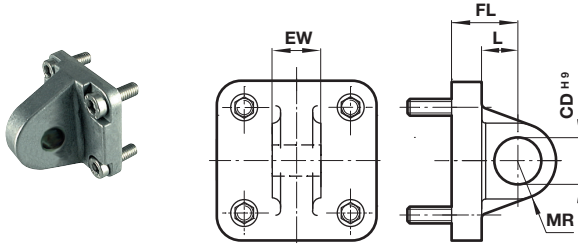


\varnothing	$\varnothing CX H7$	EX	MS	DL	R1	Z	(kg)	F _{max} (N)	Model (UR)
32	10	14	16	22	13	13 °	0,15	1.600	QA/8032/33
40	12	16	18	25	16	13 °	0,25	2.500	QA/8040/33
50	16	21	21	27	19	15 °	0,40	3.900	QA/8050/33
63	16	21	23	32	22	15 °	0,55	6.200	QA/8063/33
80	20	25	28	36	24	14 °	0,90	10.000	QA/8080/33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

Rear eye R

Conforms to ISO 15552, type MP4

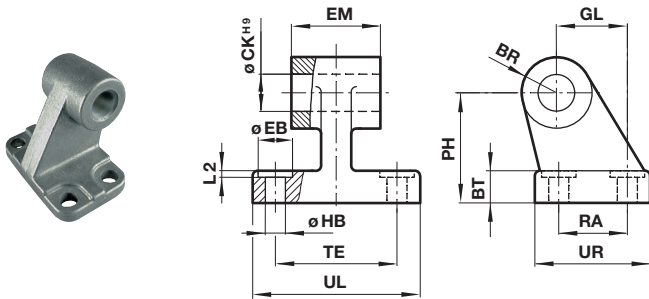
Dimensions in mm
Projection/First angle



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

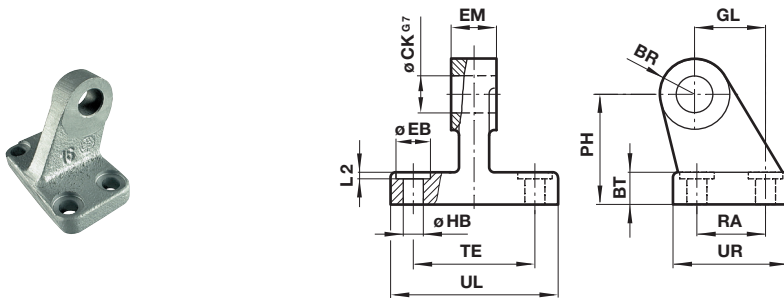
Wide hinge SW

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



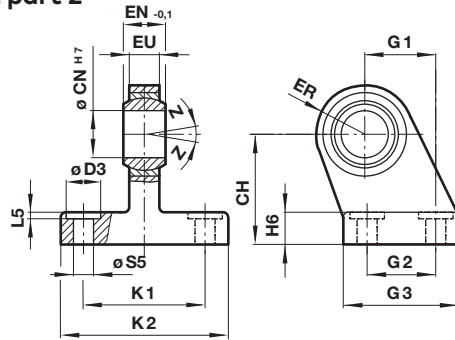
Ø	BR	BT	ØCK G7	ØEB	EM	GL	ØHB	L2	PH	RA	TE	UL	UR	(kg)	Model (SS)
32	10	8	10	11	10	21	6,6	1,6	32	18	38	51	31	0,15	M/P19931
40	11	10	12	11	12	24	6,6	1,6	36	22	41	54	35	0,20	M/P19932
50	13	12	16	15	16	33	9	1,6	45	30	50	65	45	0,48	M/P19933
63	15	12	16	15	16	37	9	1,6	50	35	52	67	50	0,50	M/P19934
80	15	14	20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



Swivel hinge US

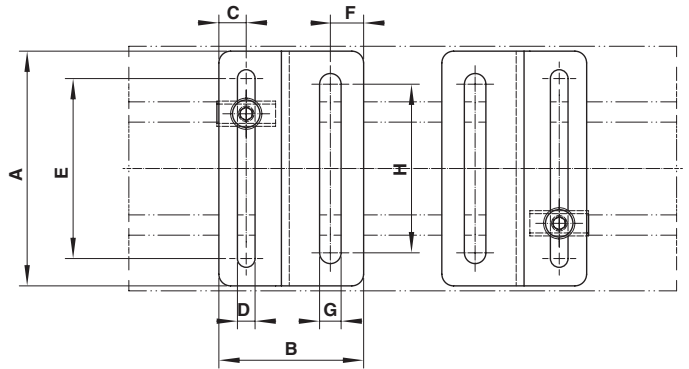
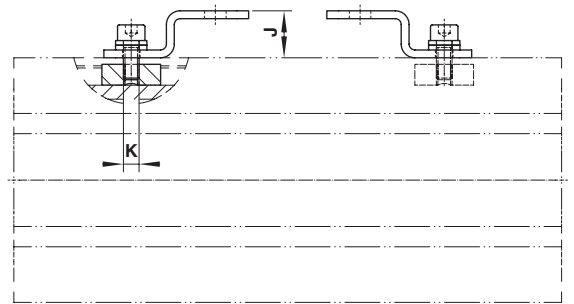
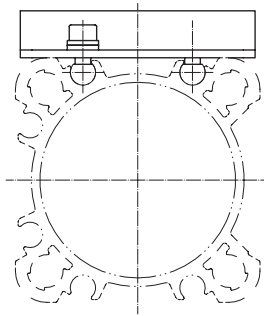
Conforms to VDMA 24562 part 2

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

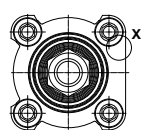
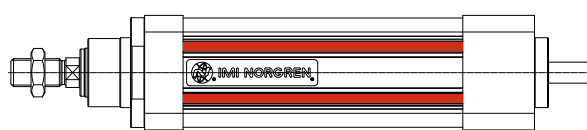
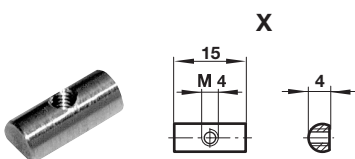


Ø	A	B	C	D	E	F	G	H	J	K	SW	(kg)	Model
32/40	45	37	7	4,5	31	8,5	5,5	28,1	12	M4	3	0,06	PQA/802032/22/54
50/63	60	37	7	4,5	46	8,5	5,5	43	12	M4	3	0,08	PQA/802050/22/54
80/100	90	37	7	4,5	76	8,5	6,5	70	12	M4	3	0,11	PQA/802080/22/54

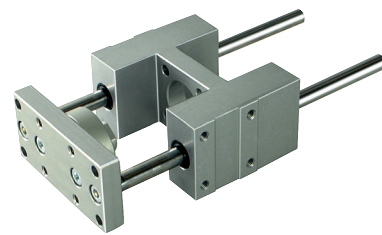
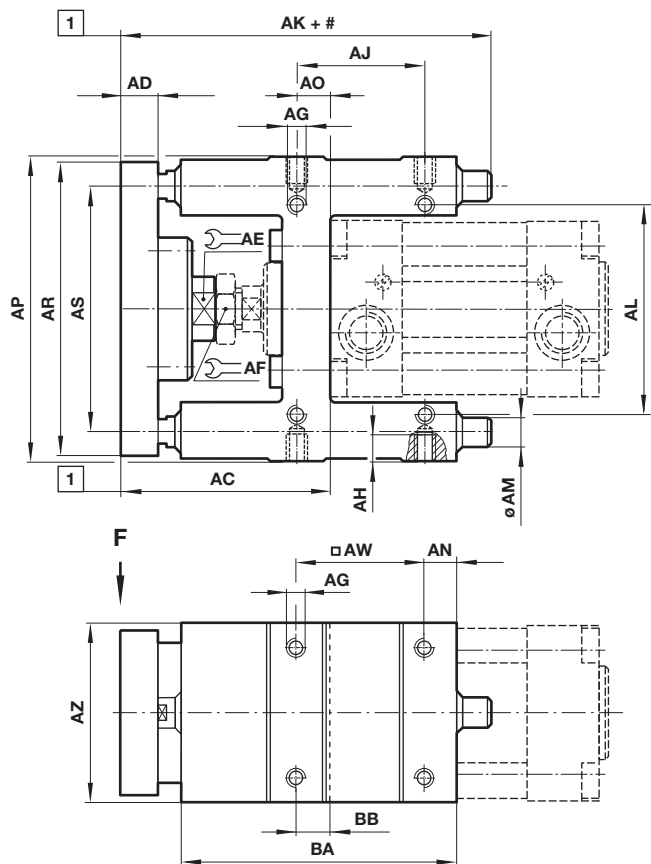
Groove key M/P72816

Weight: 0,01 (kg)

Groove cover M/P72725/1000



QA/8000/51 – Guide blocks (plain bearings)



Dimensions in mm
Projection/First angle



= Stroke
 1 Adjustment range
 Ø32 & 40 = +2
 Ø50 & 63 = +4

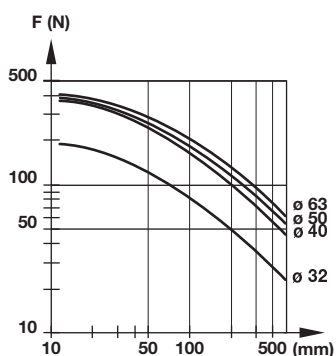
Ø	AC	AD	AE	AF	AG	AH	AJ	AK	AL	ØAM	AN	AO	AP
32	69	12	15	17	M 6	10	32,5	110	58	10	6	9	100
40	74	12	15	19	M 6	10	38	122	64	12	6	11	106
50	91,5	15	22	24	M 8	12	46,5	135	80	12	6	19	125
63	92	15	22	24	M 8	12	56,5	153	95	12	7	15	132

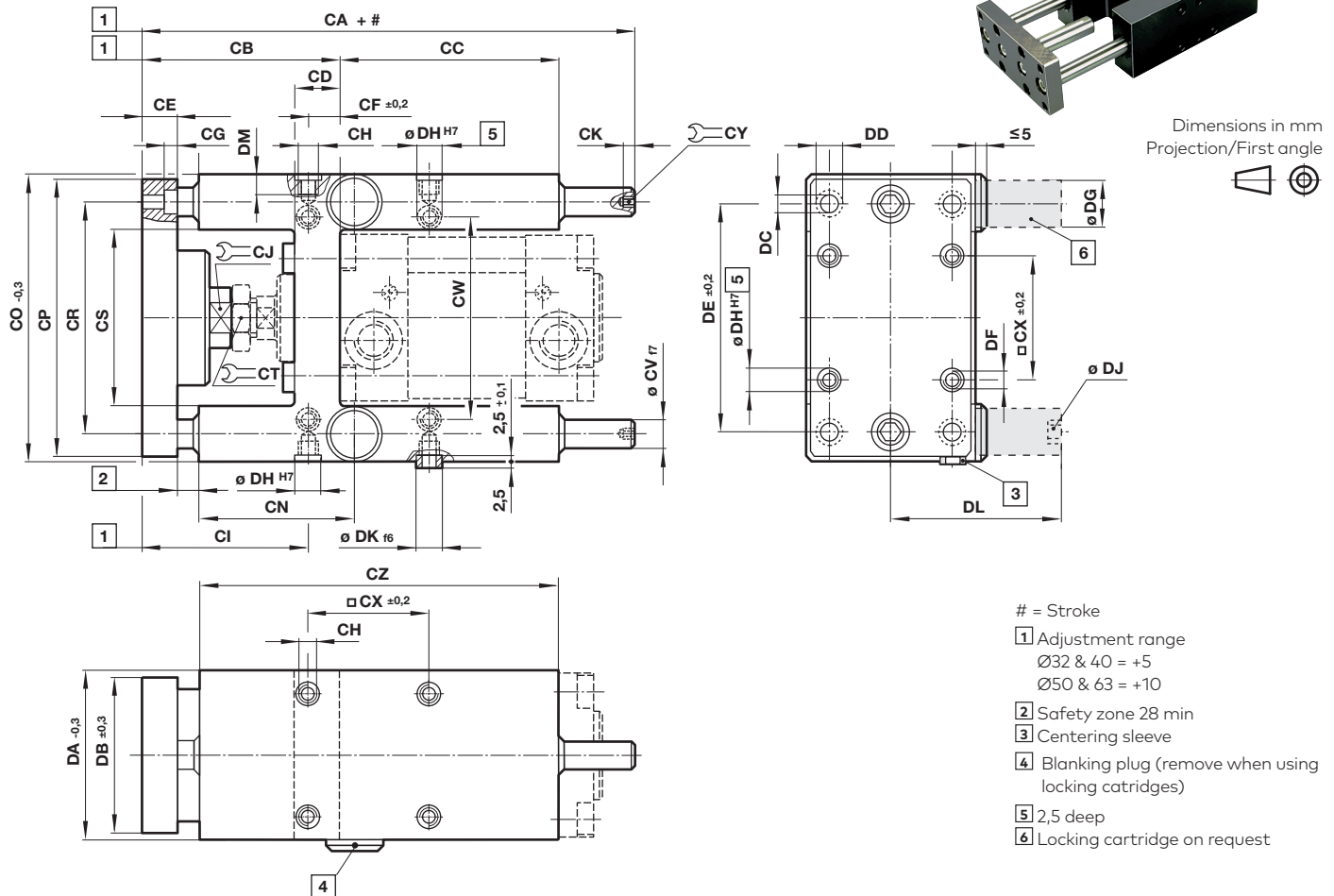
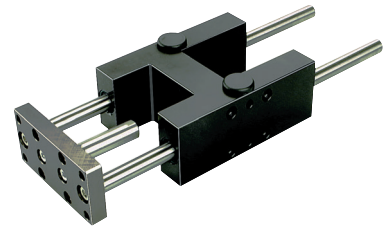
Ø	AR	AS	AT	AV	AW	ØAX	AZ	BA	BB	(kg) at 0 mm	(kg) per 100 mm	Model
32	90	74	78	45	32,5	6,6	48	76	9	1,0	0,06	QA/8032/51/*
40	100	80	84	50	38	6,6	56	85	11	1,2	0,09	QA/8040/51/*
50	120	96	100	60	46,5	9	66	99	19	1,8	0,09	QA/8050/51/*
63	125	104	105	70	56,5	9	76	114	15	2,2	0,09	QA/8063/51/*

* Insert standard stroke length: 50, 100, 160, 200, 250, 320, 400 and 500 mm, use nearest standard stroke.

Note: Supplied complete with mounting screws for cylinders

Maximum load



QA/8000/61 – Guide blocks (roller bearings)


- # = Stroke
- 1 Adjustment range
Ø32 & 40 = +5
Ø50 & 63 = +10
 - 2 Safety zone 28 min
 - 3 Centering sleeve
 - 4 Blanking plug (remove when using locking cartridges)
 - 5 2,5 deep
 - 6 Locking cartridge on request

Ø	CA	CB	CC	CD	CE	CF ±0,2	CG	CH	CI	CJ	CK	CN	CO -0,3
32	177	100	65	28	12	15,3	6,5	M6	84,5	13	5	61	97
40	192	111	69	33	12	23	6,5	M6	88	15	6	67	115
50	237	128	65	40	15	33,8	9	M8	94	22	6	75,5	137
63	237	128	97	40	15	29,3	9	M8	98,5	22	6	80	152

Ø	CP	CR	CS	CT	ØCV F7	CW	CX ±0,2	CY	CZ	DA -0,3	DB ±0,3	DC	ØDD
32	90	74	50,5	17	12	61	32,5	5	125	50	45	6,6	11
40	110	87	58,5	19	16	69	38	6	140	58	54	6,6	11
50	130	104	70,5	24	20	85	46,5	6	150	70	63	9	15
63	145	119	85,5	24	20	100	56,5	6	182	85	80	9	15

Ø	DE ±0,2	DF	ØDG	ØDH H7	DJ	ØDK f6	DL	DM	(kg) at 0 mm	(kg) per 100 mm	Locking force (N)	Cartridge *1)	Model
32	78	M6	20	9	M5	9	45	14	1,2	0,18	600	QA/8032/63	QA/8032/61/*
40	84	M6	24	9	G1/8	9	61,5	14	2,2	0,32	1000	QA/8040/63	QA/8040/61/*
50	100	M8	30	11	G1/8	11	76,5	16	3,6	0,49	1500	QA/8050/63	QA/8050/61/*
63	105	M8	30	11	G1/8	11	76,5	16	4,6	0,49	1500	QA/8050/63	QA/8063/61/*

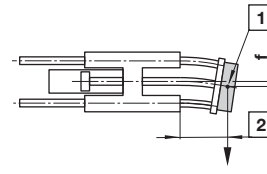
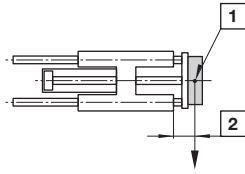
* Insert standard stroke length: 50, 100, 160, 200, 250, 320, 400 and 500 mm, use nearest standard stroke.

Note: Supplied complete with mounting screws for cylinders

*1) Locking cartridges should be ordered separately. Passive - pressure to unlock. Two required per guide block.



**Maximum load for
QA/8000/61**



Dimensions in mm
Projection/First angle



- 1 Centre of gravity load capacity
- 2 Outstroke

Maximum load capacity is dependent on the outstroke of a horizontally installed guide unit. In the case of short stroke operation, the load capacity figures taken from the diagram must be multiplied by the correction factor (diagram 2). In the curves of load capacity (diagram 1), the short stroke corrections have already been taken into account for an outstroke > 60 mm.

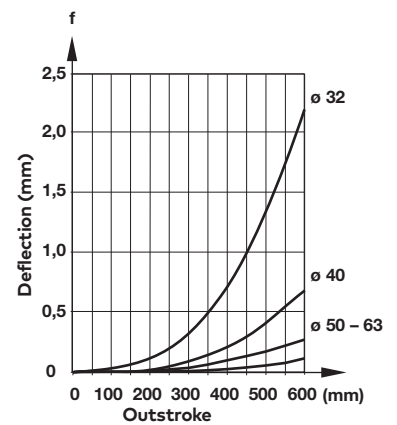
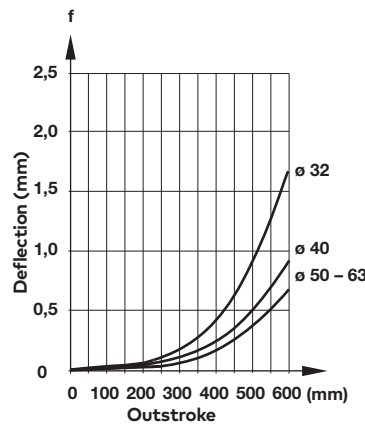
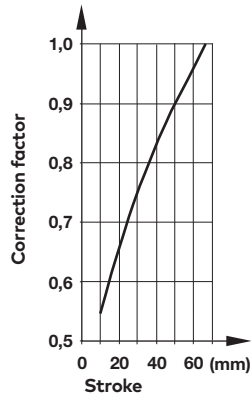
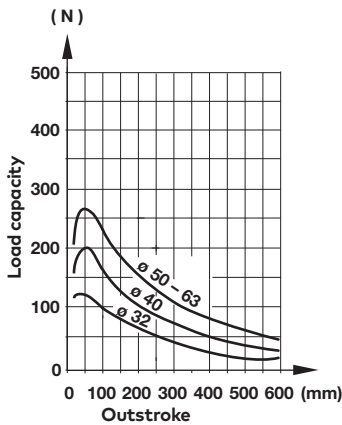
The total deflection of guide rods will be determined by the addition of that due to own weight (diagram 3) and that due to load capacity (diagram 4).

**Maximum load capacity depending on outstroke
(diagram 1)**

(diagram 2)

**Deflection caused by own
weight (diagram 3)**

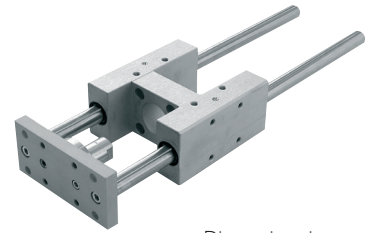
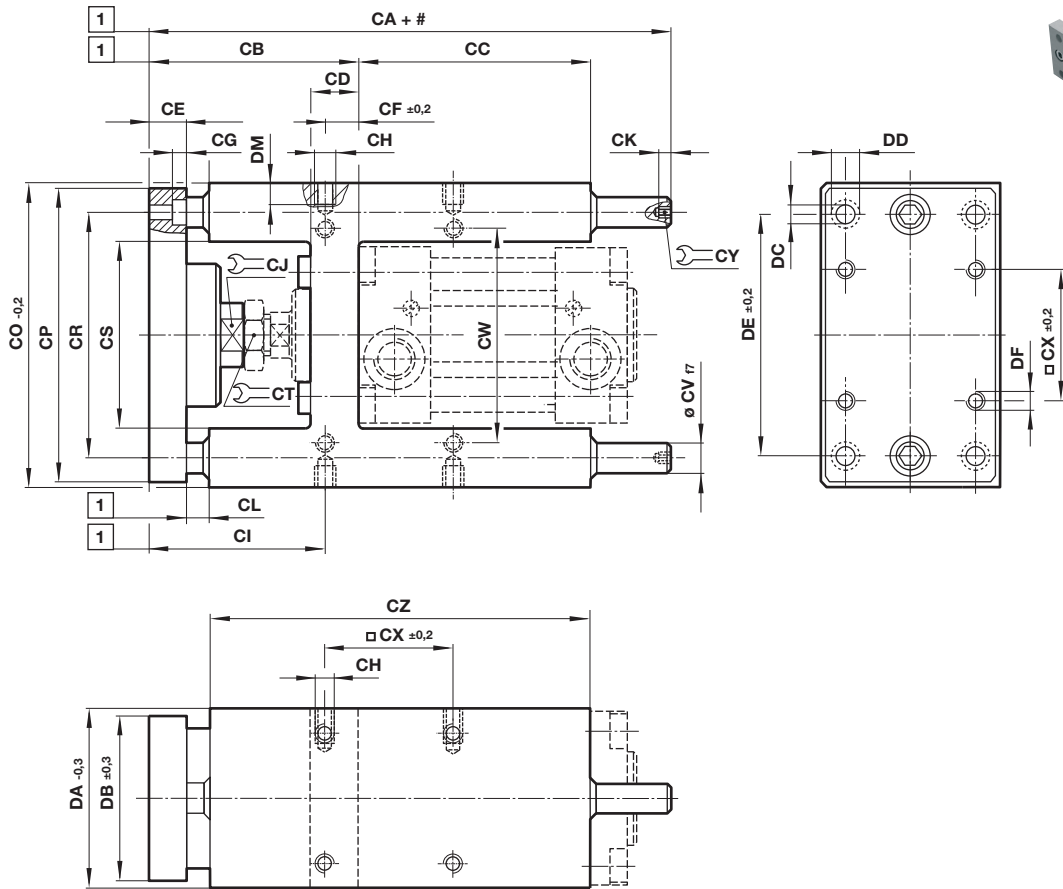
**Deflection caused by a
load of 10 N (diagram 4)**



In the case of shock load applications, the figures given in the diagrams above must be reduced by a factor of 2.



QA/8000/81 – Guide blocks (long coupling)
QA/8000/85 – Guide blocks (short coupling)



Dimensions in mm
 Projection/First angle



= Stroke
 1 Adjustment range
 Ø32 & 40 = +5
 Ø50 & 63 = +10

Ø	CA /81	CA /85	CB + /81	CB + /85	CC	CD	CE	CF ±0,2	CG	CH	CI /81	CI /85	∩ CJ
32	174	149	89	64	75	24	12	4,3	6,5	M 6	84,7	59,7	15
40	189	164	99	74	80	28	12	11	6,5	M 6	88	63	15
50	210	181	113	88	78	34	15	18,8	8,5	M 8	94,2	69,2	20
63	235	210	114	89	106	34	15	15,3	9	M 8	98,7	73,7	20

Ø	CK	CL /81	CL /85	CO ±0,2	CP	CR	∩ CS	CT	ØCV f8	CW	□CX ±0,2	CY	CZ
32	5	27	2	97	93	74	51	17	12	61	32,5	5	125
40	6	27	2	115	112	87	58,2	19	16	69	38	6	140
50	6	28	3	137	134	104	70,2	24	20	85	46,5	6	148
63	6	27	2	152	147	119	85,2	24	20	100	56,5	6	178

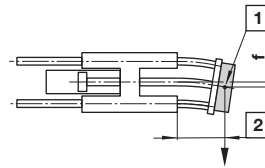
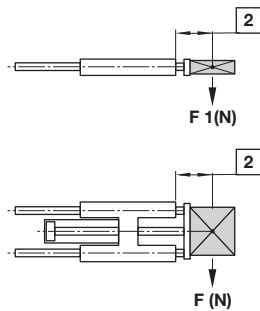
Ø	DA ±0,2	DB ±0,3	ØDC	ØDD	DE ±0,2	DF	DM	(kg) /81 at 0 mm	(kg) /85 at 0 mm	(kg) /81; /85 per 100 mm	Model /81	Model /85
32	49	45	6,6	11	78	M 6	12	1,2	1,15	0,18	QA/8032/81	QA/8032/85
40	58	55	6,6	11	84	M 6	12	2,2	2,15	0,32	QA/8040/81	QA/8040/85
50	70	65	9	15	100	M 8	16	3,6	3,55	0,49	QA/8050/81	QA/8050/85
63	85	80	9	15	105	M 8	16	4,6	4,55	0,49	QA/8063/81	QA/8063/85

* Insert standard stroke length: 50, 100, 160, 200, 250, 320, 400 and 500 mm, use nearest standard stroke.
 Note: Supplied complete with mounting screws for cylinders



Maximum load for QA/8000/81 and /85

Dimensions in mm
Projection/First angle



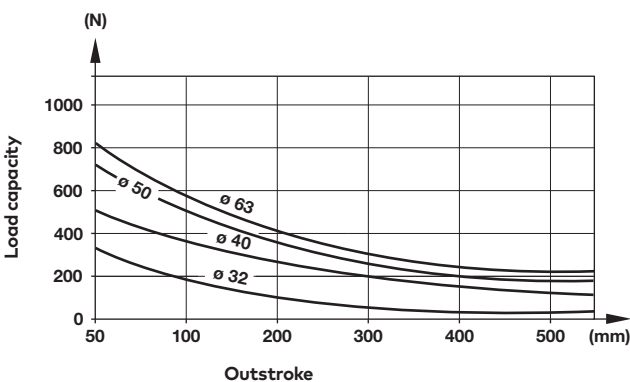
- 1 Centre of gravity load capacity
- 2 Outstroke

$F1 = F \times 0,9$
Static force: $F2 = F \times 2$

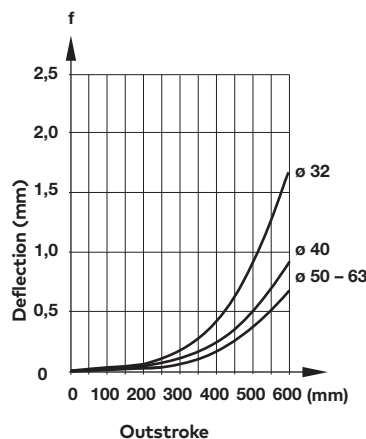
Max. load capacity (diagram 1) is dependent on the outstroke of a horizontally installed guide unit.

The total deflection of guide rods will be determined by the addition of the amount of deflection caused by own weight (according to diagram 2) plus the amount of deflection due to load capacity (according to diagram 3).

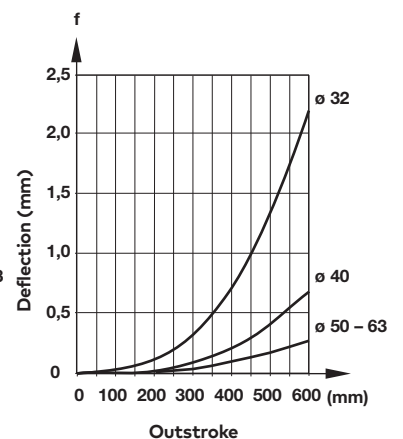
Maximum load capacity depending on outstroke (diagram 1)



Deflection caused by own weight (diagram 2)



Deflection caused by a load of 10 N (diagram 3)



In the case of shock load applications, the figures given in the diagrams above must be reduced by a factor of 2



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 silicone

3 x 0,25 PVC

Cable length:

2, 5 or 10 m

Electromagnetic compatibility

according to:


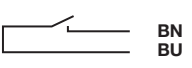
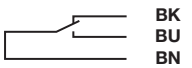
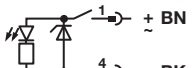
EN 60947-5-2

Materials:

Body: plastic

Cable: see table below

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

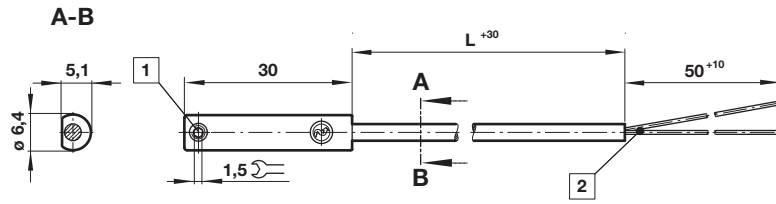
Symbol	Voltage		Current maximum	Function	Operating temperature	LED	Protection class	Plug	Cable length	Cable type	Weight	Model	
	(VAC)	(VDC)	(mA)		(°C)				(m)		(g)		
	± BN	10 ... 240	10 ... 170	180	Normally open	-25 ... +80	•	IP 66	—	2,5 or 10	PVC 2x0,25	37	M/50/LSU/*V
	~ BU	10 ... 240	10 ... 170	180	Normally open	-25 ... +80	•	IP 66	—	5	PUR 2x0,25	37	M/50/LSU/SU
	BN	10 ... 240	10 ... 170	180	Normally open	-25 ... +150	—	IP 66	—	2	Silicon 2x0,25	37	TM/50/RAU/2S
	BK	10 ... 240	10 ... 170	180	Changeover	-25 ... +80	—	IP 66	—	5	PVC 3x0,25	37	M/50/RAC/5V
	± BN	10 ... 60	10 ... 60	180	Normally open	-25 ... +80	•	IP 66	M8 x1	0,3	PVC 3x0,25	16	M/50/LSU/CP *1)
	~ BK	10 ... 60	10 ... 60	180	Normally open	-25 ... +80	•	IP 66	M12 x1	0,3	PVC 3x0,25	16	M/50/LSU/CC *1)

* Insert cable length; *1) Plug-in connector see page 41,

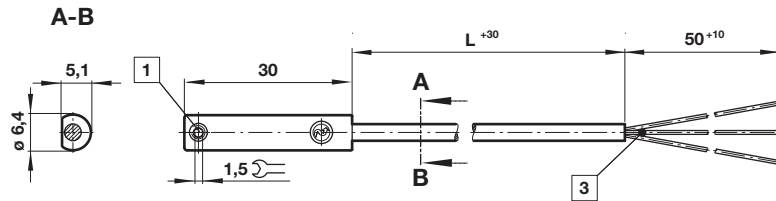
Dimensions

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

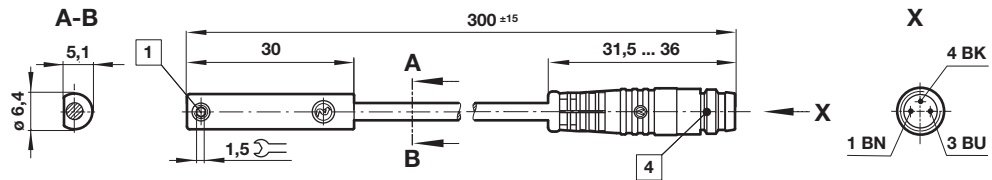
Dimensions in mm
Projection/First angle



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



**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

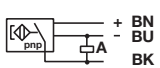
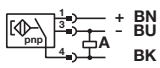
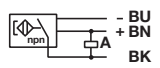
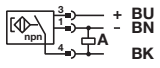
Materials:

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



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		○ •
Delay mode		○ •
Installation aid		• •
Temperature measurement		•
Detection counter		•
Teach functionality		•
Responsiveness adjustment		•

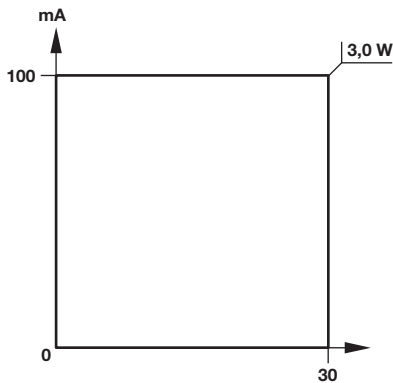
Note: IODD for the M/50/IOP switches available on the RAVEO homepage.

• = included

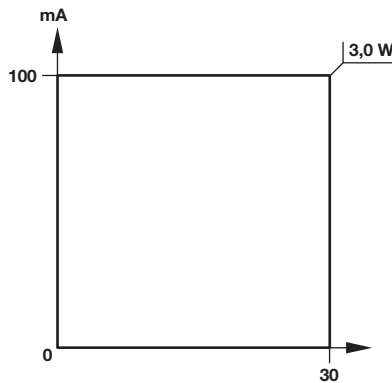
○ = optional (manufacture pre-setting required)

Switching current and switching voltage

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



M/50/EHP



Dimensions

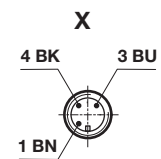
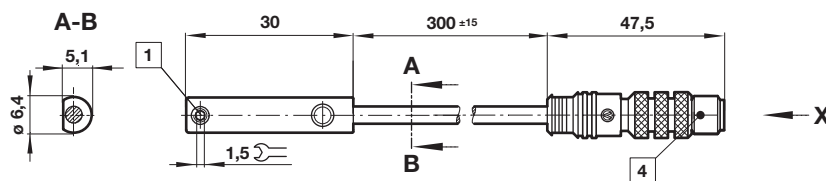
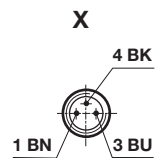
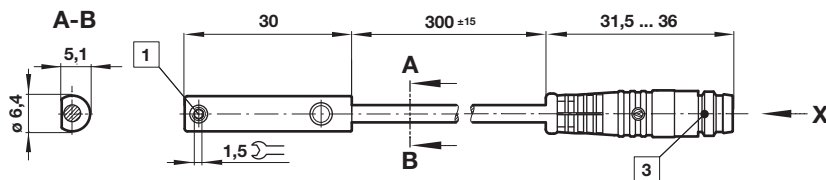
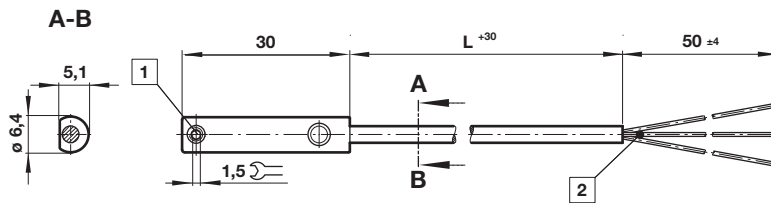
M/50/EAP/*V,
M/50/EAN/*U,
M/50/IOP/5V,
M/50/EHP/*V,
M/50/EHP/5U,
M/50/EAN/*V
Cable length L = 2, 5 or 10 m



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



Dimensions in mm
Projection/First angle



- 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




quality and proven solution to the problem



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