

- > Ø32 ... 100 mm
- > Robust construction
- > Cylinder based on ISO 15552
- > Maintenance-free
- > Reliable performance
- > Long life
- > Servo motors
- > 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:**

200 ... 400 VAC

**Current:**

1 ... 9 A

**Power:**

0,16 ... 3,3 kW

**Drive data**
**Voltage:**

200 ... 400 VAC

**Current:**

1,1 ... 10,5 A

**Power:**

0,18 ... 4,0 kW

**Duty cycle:**

100 %

**Temperature:**
**Operating temperature actuator only:**

0 °C ... 60 °C (32 °F ... 140 °F)

**Ambient temperature:**

Actuator:

0 °C ... 60 °C (32 °F ... 140 °F)

Motor:

0 °C ... 40 °C (32 °F ... 104 °F)

**IP Protection rate motor only:**

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				+ 0,04				
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)	2,8	4,7	4,9	7,7	12,7	7,5	10,3	14,3	9,5	18,9	22,4	18,8	37,5	44,8	46,6	23,1	56,9	83,1	108,4	
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/s <sup>2</sup> )	10																			
Max. angle of rotation at the piston rod (°)	0,65 °		0,6 °			0,5 °			0,4 °			0,3 °				0,25 °				

### The function

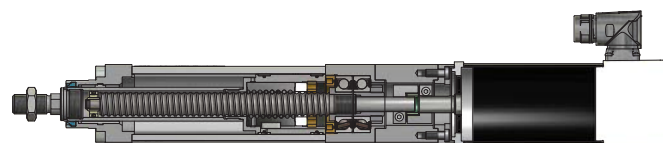
The new IMI Norgren ELION provides a high performance ball screw actuator with servo motor. The actuator can easily be configured and ordered

with the IMI Norgren online tool:

<https://www.imi-precision.com/uk/en/technical-support/configurators>

or visit our landing page for more information:

<https://www.imi-precision.com/uk/en/list/electric-actuators>








List of Content:

**Content**

General (Golden) rules	3
Cylinder Variants	4
Communications of motors, drives and bus protocols/Option Selector	7
Sizing rules and formulas	8
Permissible axial forces Fmax	9
Permissible speeds	11
Life time information	12
Example for the selection of an electromechanical actuator	13
Basic dimensions cylinders	15
Weights, moving mass, inertia	16
Mountings and accessories	21
Basic dimensions mountings	23
Guide blocks	29
Servo Motors	34
Drives	39
Switches	40
Cable / Accessories for Drives	44

**IMI Norgren Family** (Actuator ranges in the red frame are shown in this data sheet)

Picture	Function	Data sheet title	Data sheet number
	Electromechanical	E/809000/* Electromechanical actuator with or without servo motor	en 1.6.300
	Pneumatic	PRA/802000/M, RA/802000/M, RA/8000, RA/8000/M ISOLine™ 15552 cylinder, double acting	en 1.5.220
	Electromechanical	E/149000/* Electromechanical rodless spindle actuator with or without servo motor	en 1.6.400
	Electromechanical	E/148000/* Electromechanical toothed belt actuator with or without servo motor	en 1.6.500
	Pneumatic	M/146000, M/146100, M/146200, LINTRA®PLUS rodless cylinder Magnetic & Non-magnetic piston, double acting	en 1.6.009



### Golden Rules

The IMI Norgren 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 IMI Norgren 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 8, use the IMI Norgren online configurator or contact our technical service.

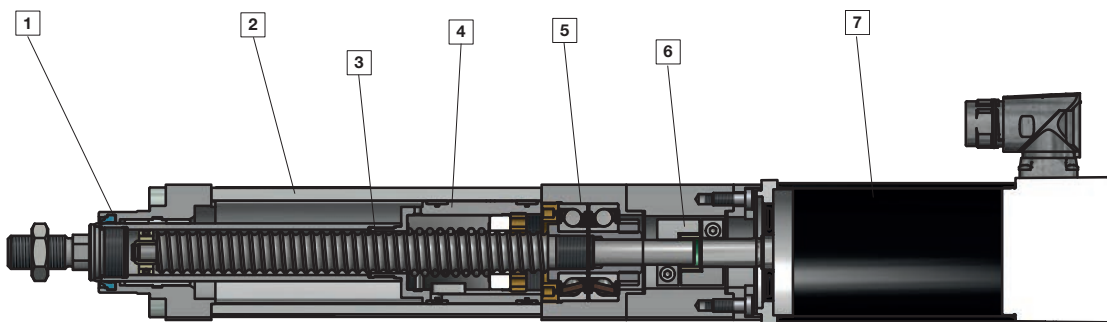
### Motor

The sizing of the motor depends on the load cycle applied to the actuator. At all times, the maximum torque requirements must stay below the mitterler

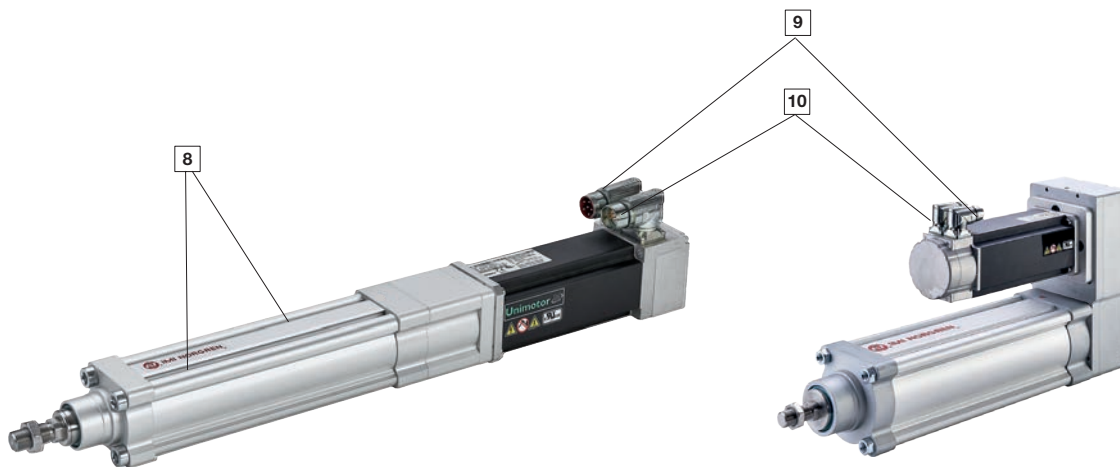
Lastmoment the motor can apply. To prevent overheating of the motor, the mean torque demand must be below the Dauermoment of the motor. For exact sizing, please refer to page 32...36, use the IMI Norgren online configurator or contact our technical service.

### Holding brake

The motors supplied by IMI Precision Engineering can be equipped with a mechanical holding brake. While both hardware and software are designed to high standards of quality and robustness, they are not intended for use as safety functions, i.e. where a fault or failure would result in a risk of injury. Do not apply the brake while the motor shaft is rotating. The brake can only take a limited number of emergency braking operations and must not be used for repeated dynamic braking.

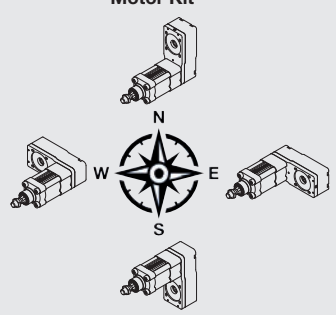


1	Piston rod bearing
2	Profile barrel
3	Spindle
4	Ball screw nut
5	Ball screw bearing
6	Coupling
7	Motor
8	Switch groove
9	Power
10	Motor feedback



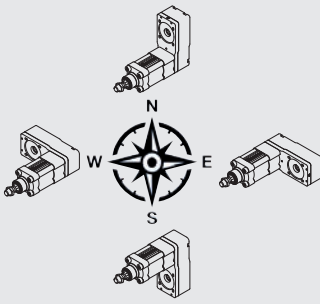
Cylinder variants

E/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				
			Standard	Piston rod bellows	Piston rod extension	Internal thread												
Ø32	032	12x5	05	M	G	U	X	Actuator only, no coupling, no housing		A	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, *				
								Axial kit	D	No motor, flange □40; ØN=30; ØM=46	X	1						
										No motor, flange □55; ØN=40; ØM=63		2						
										Motor □55 (1,05 Nm)	E	A	B	M			N	
								Parallel kit - "North"	N	No motor, flange □40; ØN=30; ØM=46	X	1						
		No motor, flange □55; ØN=40; ØM=63		2														
		Motor □55 (1,05 Nm)	E	A	B	M	N											
		Parallel kit - "East"	E	No motor, flange □40; ØN=30; ØM=46	X	1												
				No motor, flange □55; ØN=40; ØM=63		2												
				Motor □55 (1,05 Nm)	E	A	B	M	N									
		Parallel kit - "South"	S	No motor, flange □40; ØN=30; ØM=46	X	1												
No motor, flange □55; ØN=40; ØM=63				2														
Motor □55 (1,05 Nm)	E			A	B	M	N											
Parallel kit - "West"	W	No motor, flange □40; ØN=30; ØM=46	X	1														
		No motor, flange □55; ØN=40; ØM=63		2														
		Motor □55 (1,05 Nm)	E	A	B	M	N											
Ø40	040	16x5	05	M	G	U	X	Actuator only, no coupling, no housing		A	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			09, 12, 14, *				
								Axial kit	D	No motor, flange □55; ØN=40; ØM=63	X	1						
										No motor, flange □67; ØN=60; ØM=75		2						
										Motor □55 (1,05 Nm)	E	A	B	M			N	
								Motor □67 (2,45 Nm)	J									
		Parallel kit - "North"	N	No motor, flange □55; ØN=40; ØM=63	X	1												
				No motor, flange □67; ØN=60; ØM=75		2												
				Motor □55 (1,05 Nm)	E	A	B	M	N									
		Motor □67 (2,45 Nm)	J															
Parallel kit - "East"	E	No motor, flange □55; ØN=40; ØM=63	X	1														
		No motor, flange □67; ØN=60; ØM=75		2														
		Motor □55 (1,05 Nm)	E	A	B	M	N											
Motor □67 (2,45 Nm)	J																	
Parallel kit - "South"	S	No motor, flange □55; ØN=40; ØM=63	X	1														
		No motor, flange □67; ØN=60; ØM=75		2														
		Motor □55 (1,05 Nm)	E	A	B	M	N											
Motor □67 (2,45 Nm)	J																	
Parallel kit - "West"	W	No motor, flange □55; ØN=40; ØM=63	X	1														
		No motor, flange □67; ØN=60; ØM=75		2														
		Motor □55 (1,05 Nm)	E	A	B	M	N											
Motor □67 (2,45 Nm)	J																	

\* For more versions please contact the technical service.

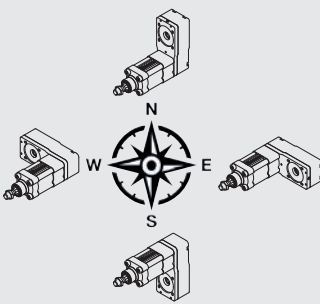
**Cylinder variants**
**E/809★★★★/★★★★/★★★★/★★★★**

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

\* For more versions please contact the technical service.

Cylinder variants

E/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 Piston rod bellows Piston rod extension Internal thread			Resolver Absolute (multi turn) Holding brake, resolver Holding brake, absolute (multi turn)											
Ø80	080	M	G	U	X	100 ... 1500	1 ... 350 (Use only for Variant "U" otherwise leave empty)									
								32x5	05	A Actuator only, no coupling, no housing B Actuator with coupling and housing for customer individual motor	No motor	X	X	14, 18, 19, *		
	32x10							10	D	Axial kit	No motor, flange □67; ØN=60; ØM=75	X	1			
											No motor, flange □89; ØN=80; ØM=100	R	2			
	32x20							20	N	Parallel kit - "North"	Motor (□67; 3,50 Nm)	N	A	B	M	N
											Motor (□89; 6,90 Nm)	R	1	2		
	32x32	32	E	Parallel kit - "East"	No motor, flange □67; ØN=60; ØM=75			X	1							
					No motor, flange □89; ØN=80; ØM=100			R	2							
	32x32	32	S	Parallel kit - "South"	Motor (□67; 3,50 Nm)			N	A	B	M	N				
					Motor (□89; 6,90 Nm)			R	1	2						
	32x32	32	W	Parallel kit - "West"	No motor, flange □67; ØN=60; ØM=75			X	1							
					No motor, flange □89; ØN=80; ØM=100			R	2							
Ø100	100	M	G	U	X	100 ... 1500	1 ... 350 (Use only for Variant "U" otherwise leave empty)									
								40x5	05	A Actuator only, no coupling, no housing B Actuator with coupling and housing for customer individual motor	No motor	X	X	19, 22, 24, *		
	40x10							10	D	Axial kit	No motor, flange □89; ØN=80; ØM=100	X	1			
											No motor, flange □115; ØN=110; ØM=130	R	2			
	40x20							20	N	Parallel kit - "North"	Motor (□89; 6,90 Nm)	N	A	B	M	N
											Motor (□115; 10,50 Nm)	R	1	2		
	40x40	40	E	Parallel kit - "East"	No motor, flange □89; ØN=80; ØM=100			X	1							
					No motor, flange □115; ØN=110; ØM=130			R	2							
	40x40	40	S	Parallel kit - "South"	Motor (□89; 6,90 Nm)			N	A	B	M	N				
					Motor (□115; 10,50 Nm)			R	1	2						
	40x40	40	W	Parallel kit - "West"	No motor, flange □89; ØN=80; ØM=100			X	1							
					No motor, flange □115; ØN=110; ØM=130			R	2							
40x40	40	W	Parallel kit - "West"	Motor (□89; 6,90 Nm)	N	A	B	M	N							
				Motor (□115; 10,50 Nm)	R	1	2									

\* For more versions please contact the technical service.

Communications of motors, drives and bus protocols

Symbol	□55 □67 □89 □115				Bus Protocol - Option Module Card *						Standard model drive	Description	Page
	SI-PROFINET RT V2	SI-PROFIBUS	SI-EtherNet	SI-EtherCAT	SI-CANopen	SI-DeviceNet							
	X	X									QE/D01400030	Standard drive with internal Bus- system (for motor size □55 - 67)	39
			X	X	X	X	X	X	X	X	QE/D02400105	Standard drive with internal Bus- system (for motor size □89 - 115)	

For more details see page 39

Option selector

**E/809\*\*\*\*/\*\*\*\*/\*\*\*\*/\*\*\*\***

<table border="1" style="width: 100%;"> <tr> <th>Cylinder Ø</th> <th>Substitute 1</th> </tr> <tr><td>32</td><td>032</td></tr> <tr><td>40</td><td>040</td></tr> <tr><td>50</td><td>050</td></tr> <tr><td>63</td><td>063</td></tr> <tr><td>80</td><td>080</td></tr> <tr><td>100</td><td>100</td></tr> <tr> <th>Spindle pitch</th> <th>Substitute 2</th> </tr> <tr><td>5</td><td>05</td></tr> <tr><td>10</td><td>10</td></tr> <tr><td>16</td><td>16</td></tr> <tr><td>20</td><td>20</td></tr> <tr><td>25</td><td>25</td></tr> <tr><td>32</td><td>32</td></tr> <tr><td>40</td><td>40</td></tr> <tr> <th>Variants</th> <th>Substitute 3</th> </tr> <tr><td>Standard</td><td>M</td></tr> <tr><td>Piston rod bellows</td><td>G</td></tr> <tr> <th>Piston rod extension</th> <th>U</th> </tr> <tr> <td>E/809****U****/****/****</td> <td><b>Extension (mm)</b></td> </tr> <tr> <td>Piston rod thread female</td> <td>X</td> </tr> </table>	Cylinder Ø	Substitute 1	32	032	40	040	50	050	63	063	80	080	100	100	Spindle pitch	Substitute 2	5	05	10	10	16	16	20	20	25	25	32	32	40	40	Variants	Substitute 3	Standard	M	Piston rod bellows	G	Piston rod extension	U	E/809****U****/****/****	<b>Extension (mm)</b>	Piston rod thread female	X	<table border="1" style="width: 100%;"> <tr> <th>Orderstroke (mm)</th> <th>Substitute 7</th> </tr> <tr><td>100 ... 1500</td><td></td></tr> <tr> <th>Motor / Feedback /Brake</th> <th>Substitute 6</th> </tr> <tr><td>Motor with resolver, without brake</td><td>A</td></tr> <tr><td>Motor with Absolute (Multi turn), without brake</td><td>B</td></tr> <tr><td>Motor with resolver, with brake</td><td>M</td></tr> <tr><td>Motor with Absolute (Multi turn), with brake</td><td>N</td></tr> <tr><td>No motor, no coupling, no housing</td><td>X</td></tr> <tr><td>No motor; small flange</td><td>1</td></tr> <tr><td>No motor; big flange</td><td>2</td></tr> <tr> <th>Flange</th> <th>Substitute 5</th> </tr> <tr><td>Flange for motor □55; 1,05 Nm</td><td>E</td></tr> <tr><td>Flange for motor □67, 2,45 Nm</td><td>J</td></tr> <tr><td>Flange for motor □67; 3,50 Nm</td><td>N</td></tr> <tr><td>Flange for motor □89; 6,90 Nm</td><td>R</td></tr> <tr><td>Flange for motor □115; 10,50 Nm</td><td>W</td></tr> <tr><td>No motor (see Substitute 6 for flange) E/809****/****/X****</td><td>X</td></tr> <tr><td>No motor, no coupling, no housing</td><td>X</td></tr> <tr><td>No motor; small flange</td><td>1</td></tr> <tr><td>No motor; big flange</td><td>2</td></tr> <tr> <th>Motor mounting</th> <th>Substitute 4</th> </tr> <tr><td>Axial</td><td>D</td></tr> <tr><td>Parallel - "North"</td><td>N</td></tr> <tr><td>Parallel - "East"</td><td>E</td></tr> <tr><td>Parallel - "South"</td><td>S</td></tr> <tr><td>Parallel - "West"</td><td>W</td></tr> <tr><td>Actuator only, no coupling, no housing</td><td>A</td></tr> <tr><td>Actuator with coupling and housing for customer individual motor</td><td>B</td></tr> <tr> <td>Use Sub. 5 &amp; 6 as motor shaft diameter E/809****/****/B****</td> <td><b>07 ... 24</b></td> </tr> <tr><td>E.g. 07 = 7 mm motor shaft</td><td></td></tr> <tr><td>08 = 8 mm motor shaft</td><td></td></tr> <tr><td>...</td><td></td></tr> <tr><td>24 = 24 mm motor shaft</td><td></td></tr> </table>	Orderstroke (mm)	Substitute 7	100 ... 1500		Motor / Feedback /Brake	Substitute 6	Motor with resolver, without brake	A	Motor with Absolute (Multi turn), without brake	B	Motor with resolver, with brake	M	Motor with Absolute (Multi turn), with brake	N	No motor, no coupling, no housing	X	No motor; small flange	1	No motor; big flange	2	Flange	Substitute 5	Flange for motor □55; 1,05 Nm	E	Flange for motor □67, 2,45 Nm	J	Flange for motor □67; 3,50 Nm	N	Flange for motor □89; 6,90 Nm	R	Flange for motor □115; 10,50 Nm	W	No motor (see Substitute 6 for flange) E/809****/****/X****	X	No motor, no coupling, no housing	X	No motor; small flange	1	No motor; big flange	2	Motor mounting	Substitute 4	Axial	D	Parallel - "North"	N	Parallel - "East"	E	Parallel - "South"	S	Parallel - "West"	W	Actuator only, no coupling, no housing	A	Actuator with coupling and housing for customer individual motor	B	Use Sub. 5 & 6 as motor shaft diameter E/809****/****/B****	<b>07 ... 24</b>	E.g. 07 = 7 mm motor shaft		08 = 8 mm motor shaft		...		24 = 24 mm motor shaft	
Cylinder Ø	Substitute 1																																																																																																												
32	032																																																																																																												
40	040																																																																																																												
50	050																																																																																																												
63	063																																																																																																												
80	080																																																																																																												
100	100																																																																																																												
Spindle pitch	Substitute 2																																																																																																												
5	05																																																																																																												
10	10																																																																																																												
16	16																																																																																																												
20	20																																																																																																												
25	25																																																																																																												
32	32																																																																																																												
40	40																																																																																																												
Variants	Substitute 3																																																																																																												
Standard	M																																																																																																												
Piston rod bellows	G																																																																																																												
Piston rod extension	U																																																																																																												
E/809****U****/****/****	<b>Extension (mm)</b>																																																																																																												
Piston rod thread female	X																																																																																																												
Orderstroke (mm)	Substitute 7																																																																																																												
100 ... 1500																																																																																																													
Motor / Feedback /Brake	Substitute 6																																																																																																												
Motor with resolver, without brake	A																																																																																																												
Motor with Absolute (Multi turn), without brake	B																																																																																																												
Motor with resolver, with brake	M																																																																																																												
Motor with Absolute (Multi turn), with brake	N																																																																																																												
No motor, no coupling, no housing	X																																																																																																												
No motor; small flange	1																																																																																																												
No motor; big flange	2																																																																																																												
Flange	Substitute 5																																																																																																												
Flange for motor □55; 1,05 Nm	E																																																																																																												
Flange for motor □67, 2,45 Nm	J																																																																																																												
Flange for motor □67; 3,50 Nm	N																																																																																																												
Flange for motor □89; 6,90 Nm	R																																																																																																												
Flange for motor □115; 10,50 Nm	W																																																																																																												
No motor (see Substitute 6 for flange) E/809****/****/X****	X																																																																																																												
No motor, no coupling, no housing	X																																																																																																												
No motor; small flange	1																																																																																																												
No motor; big flange	2																																																																																																												
Motor mounting	Substitute 4																																																																																																												
Axial	D																																																																																																												
Parallel - "North"	N																																																																																																												
Parallel - "East"	E																																																																																																												
Parallel - "South"	S																																																																																																												
Parallel - "West"	W																																																																																																												
Actuator only, no coupling, no housing	A																																																																																																												
Actuator with coupling and housing for customer individual motor	B																																																																																																												
Use Sub. 5 & 6 as motor shaft diameter E/809****/****/B****	<b>07 ... 24</b>																																																																																																												
E.g. 07 = 7 mm motor shaft																																																																																																													
08 = 8 mm motor shaft																																																																																																													
...																																																																																																													
24 = 24 mm motor shaft																																																																																																													

Note: If position is not required, disregard option position with part number e.g. E/809032/05M/DEA/200.  
 For combinations of cylinder variants consult our technical service.  
 This option selector explains only the cylinder variants.  
 Additional variants/options are not possible.  
 Details see table on page 4.

## 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 IMI Norgren 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 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 <sup>2</sup>
$m_{mov,act}$	Moving mass of the actuator	kg
$m_{load}$	Load mass applied on actuator	kg
$\Delta x$	Stroke of each movement	m
$\varphi$	Direction of the movement	°
$\mu$	Friction coefficient	-
$g$	Gravitational acceleration	m/s <sup>2</sup>

### 3. Selection of the actuator

#### 3.1 Safety stroke

The maximum stroke of the actuator (order stroke) must be larger than the maximum stroke during the load cycle (working stroke). Different actuator diameters offer different maximum stroke lengths.

$$x_{max,cycle} < x_{actuator}$$

For safety reasons, an additional stroke of twice the spindle pitch should be added to both sides of the actuator to prevent the spindle nut from moving into the mechanical end stops.

$$x_{actuator} \geq x_{max,cycle} + 4 \cdot P_{spindle}$$

#### 3.2 Spindle pitch

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

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

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 (diagr. p. 35 to 38).

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

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

$T$	Torque	Nm
$rpm$	Rotational speed	min <sup>-1</sup>
$v_{max,step}$	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 (diagr. p. 35 to 38).

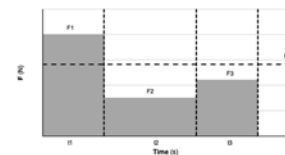
$$T_{rms} = \sqrt{\sum \left( \frac{F_{tot,step} \cdot P_{spindle}}{2\pi \cdot 0.85} \right)^2 \cdot \frac{t_{step}}{t_{tot}}}$$

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

### 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  $P$ .

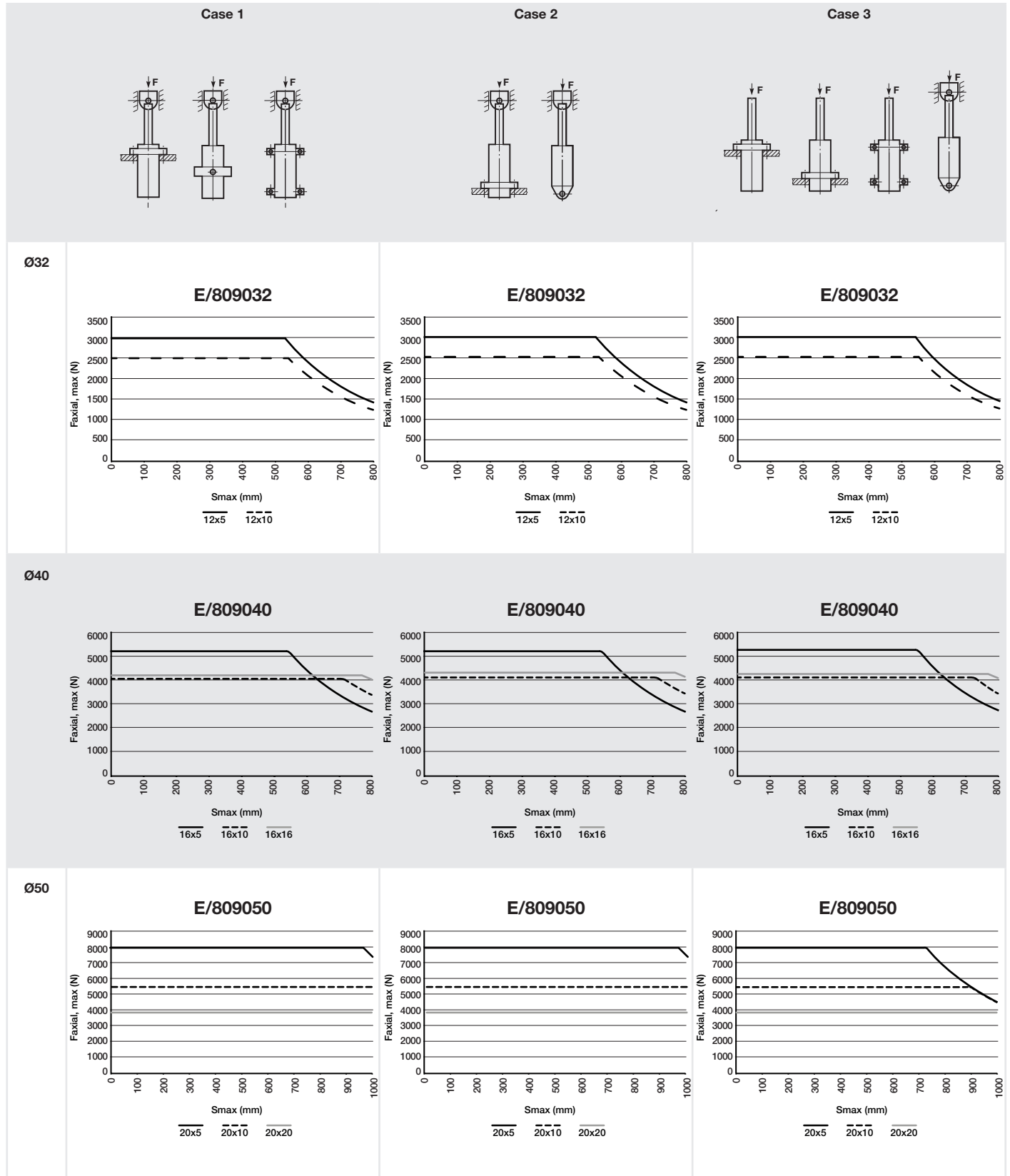
$$L_{km} = L \cdot P \cdot 10^{-6}$$

For more information please visit:

<https://www.imi-precision.com/uk/en/list/electric-actuators>

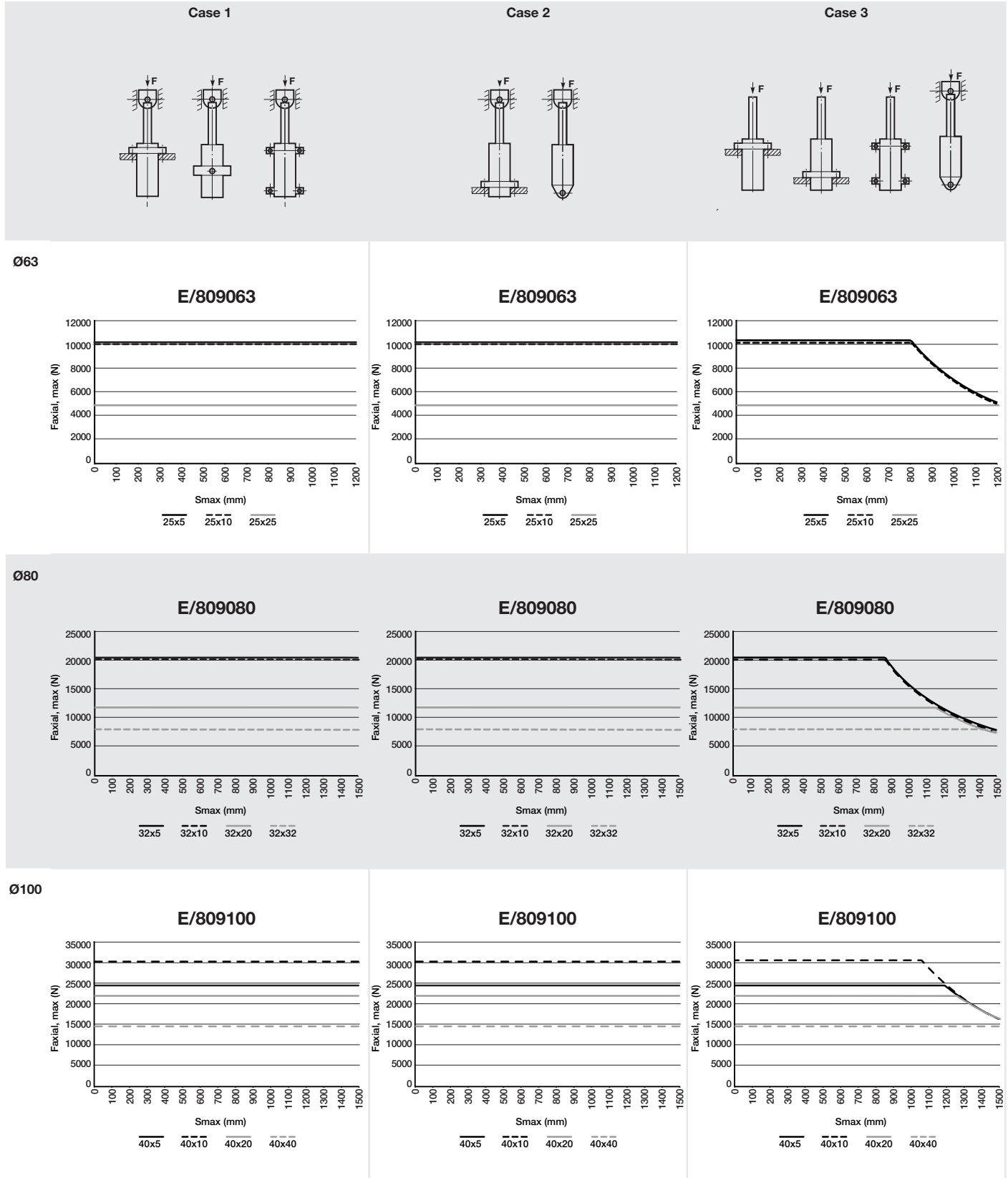


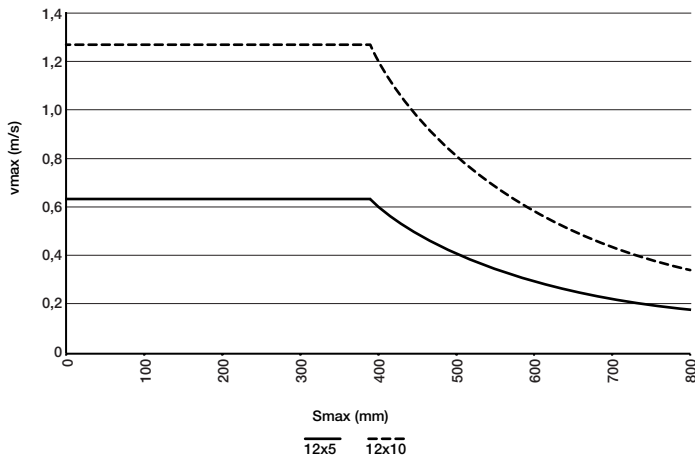
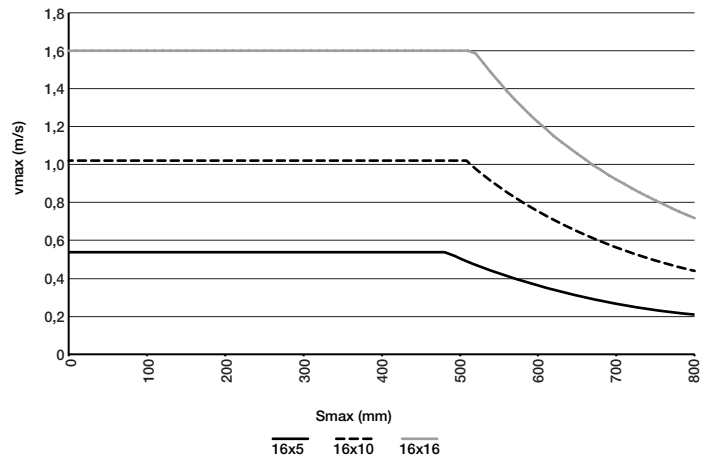
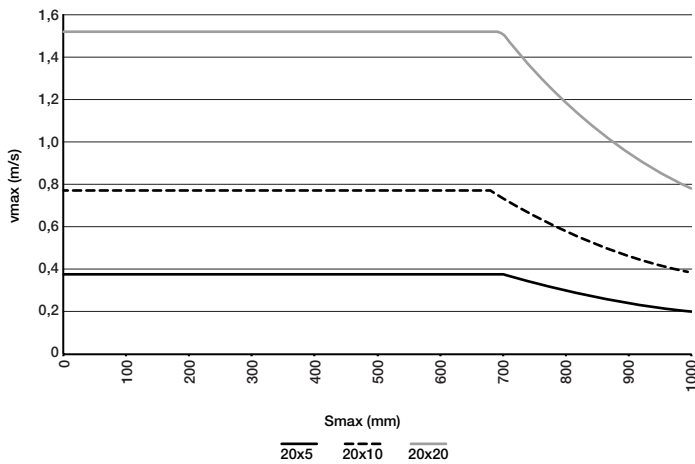
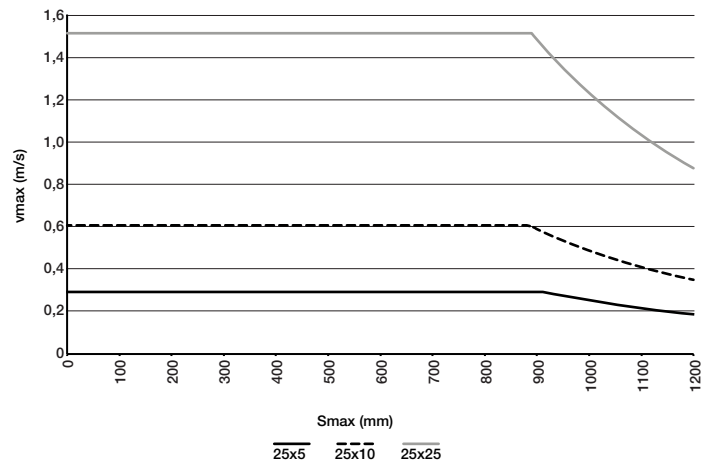
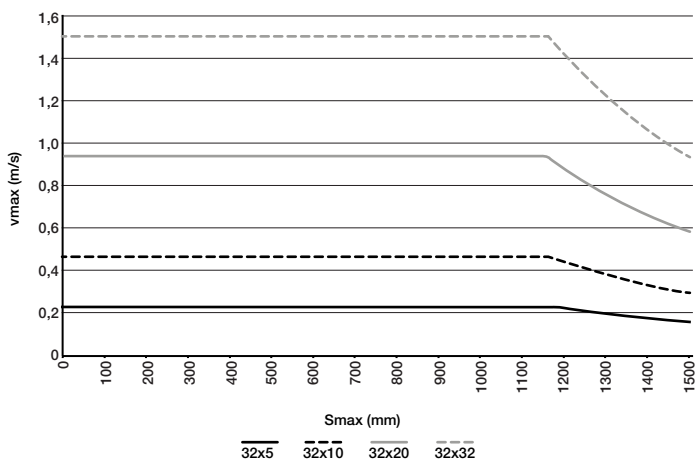
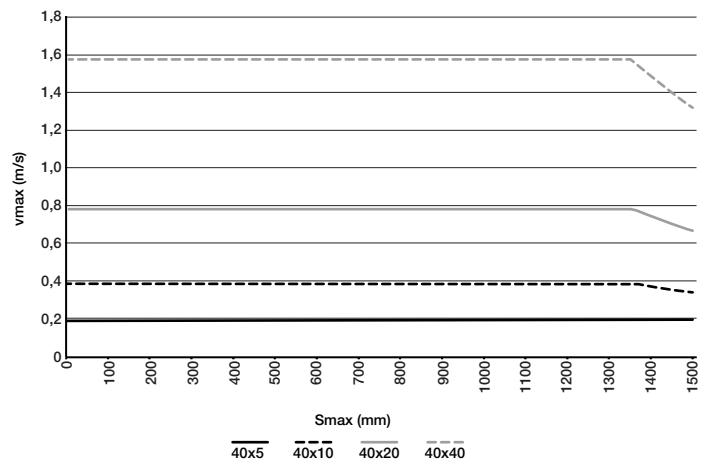
Cylinder variants  
Permissible axial forces  $F_{max}$



Cylinder variants

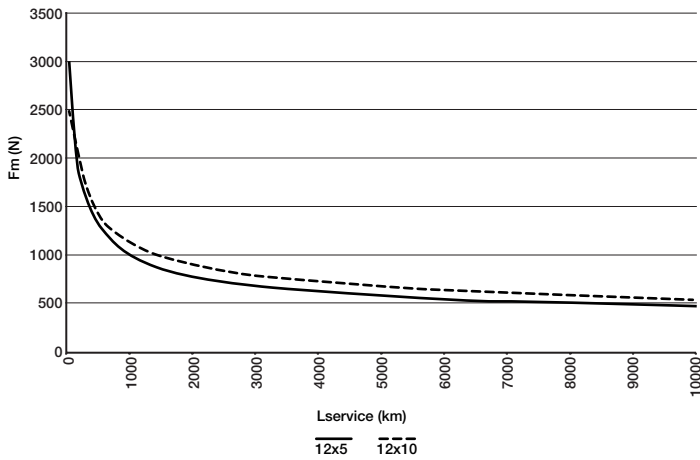
Permissible axial forces  $F_{max}$



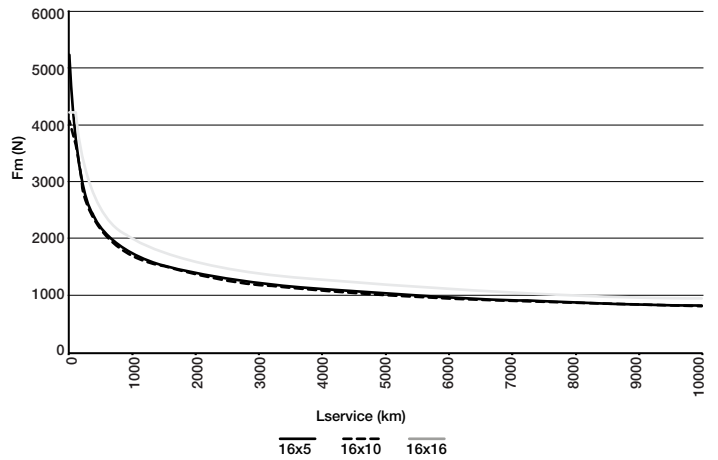
**Permissible Speeds**
**E/809032**

**E/809040**

**E/809050**

**E/809063**

**E/809080**

**E/809100**


**Force Life Time**

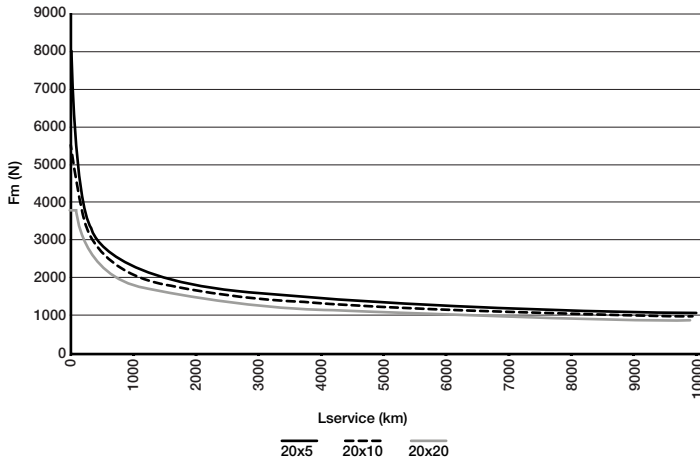
**E/809032**



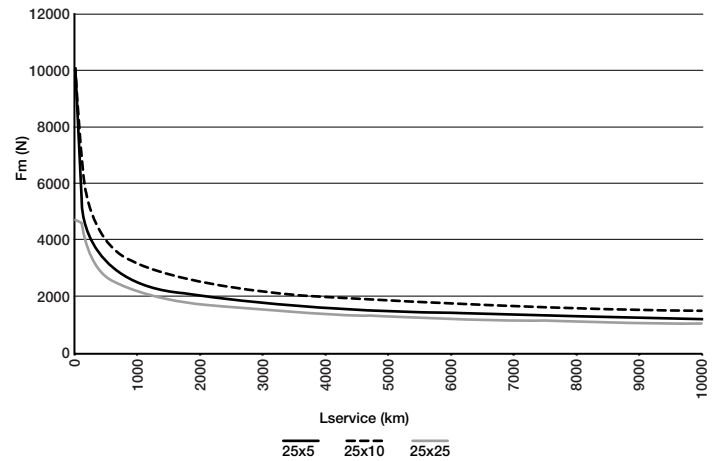
**E/809040**



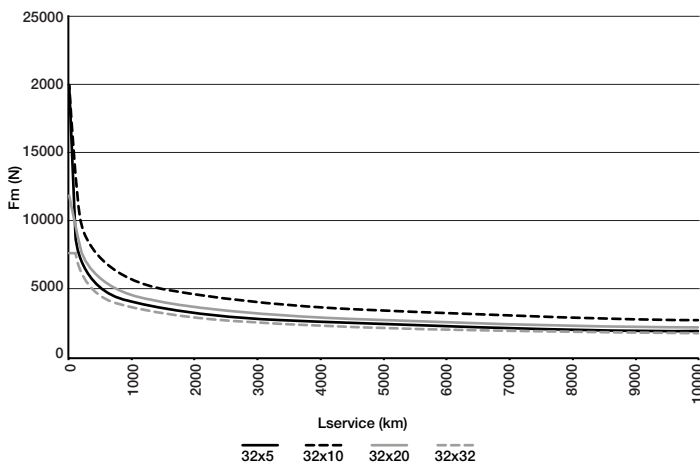
**E/809050**



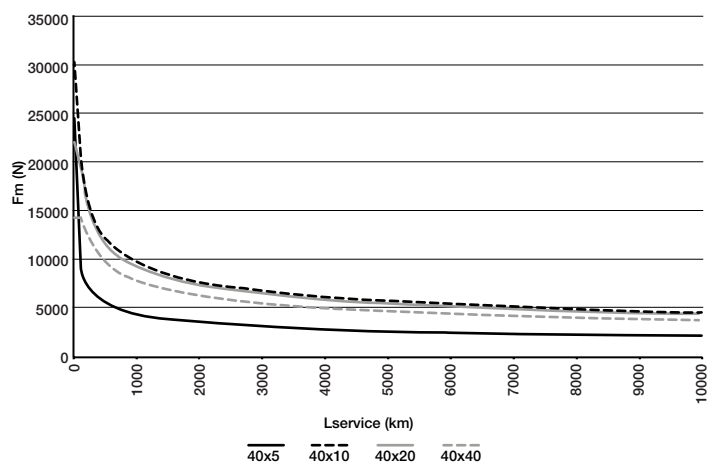
**E/809063**



**E/809080**



**E/809100**



**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	$T'_{\text{max}}$		35 °C
f) Material requirements			keine
g) Maximum speed (instroke)	$v_1$	$= \frac{\frac{\Delta x}{2}}{\frac{1}{3} t_{\text{in}}} =$	0,142 m/s
h) Maximum speed (outstroke)	$v_2$	$= \frac{\frac{\Delta x}{2}}{\frac{1}{3} t_{\text{out}}} =$	0,425 m/s
i) Mean speed	$v_m$	$= \sum_{j=1}^n \frac{t_j}{t_{\text{tot}}} \cdot v_j =$	0,106 m/s
j) Mean Force	$F_m$	$= \sqrt[3]{\sum_{j=1}^n \left( F_j^3 \cdot \frac{v_j}{v_m} \cdot t_j / t_{\text{tot}} \right)} =$	795 N
k) Life expectancy in load cycles	$\mathcal{L}_{\text{zykl}}$		1.000.000
l) Life expectancy in km	$\mathcal{L}_{\text{km}}$	$1.000.000 \times (850 \text{ mm} / 1.000.000 \text{ km/mm}) \times 2$	1.700 km

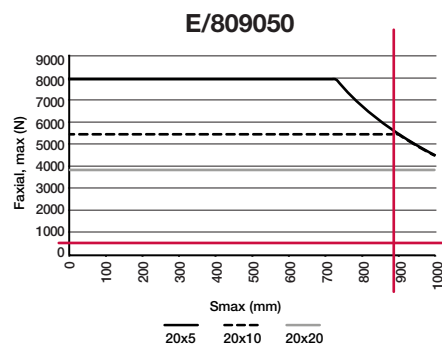
**Step 2: Selection of suitable actuators based on the working stroke**

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)	2,8	4,7	4,9	7,7	12,7	7,5	10,3	14,3	9,5	18,9	22,4	18,8	37,5	44,8	46,6	23,1	56,9	83,1	108,4	
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 <sup>2</sup> )	10																			
Max. angle of rotation at the piston rod (°)	0,65 °		0,6 °			0,5 °			0,4 °			0,3 °				0,25 °				

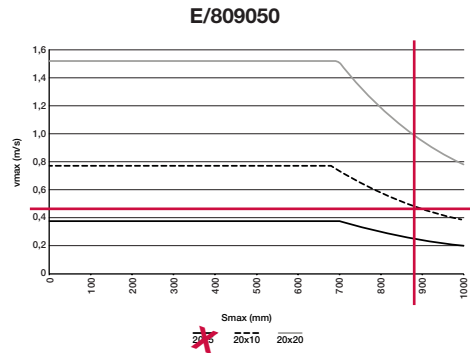
**Step 3: Selection of suitable actuators based on the maximum permissible forces**

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.



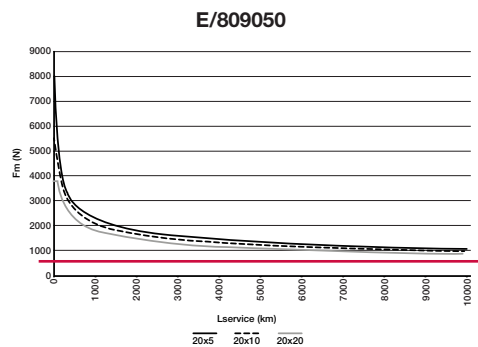
**Step 4: Selection of suitable actuators based on the maximum permissible speed**

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 two times the spindle pitch is recommended at each end side:

$$\begin{aligned} \text{Order stroke} &= \text{working stroke} + 4 \times \text{spindle pitch} \\ &= 850 \text{ mm} + 4 \times 10 \text{ mm} \\ &= \mathbf{890 \text{ mm}} \end{aligned}$$

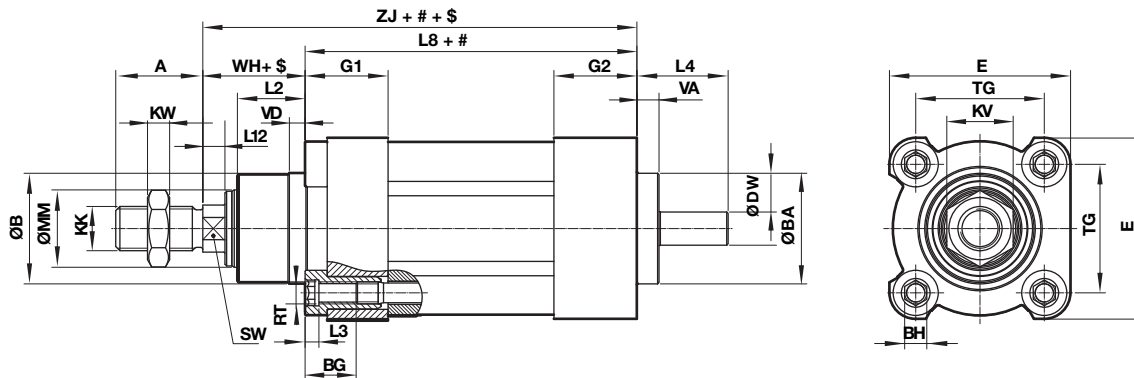
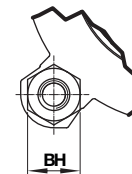
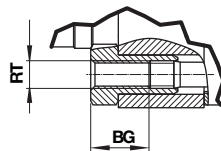
**Step 7: Check all remaining parameters**

- e) temperature requirement of  $T_{max} = 35 \text{ }^\circ\text{C}$  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.

**Basic dimensions**
**E/809000/\*\*M/AXX, E/809000/\*\*U/AXX**
**Standard cylinder without motor, no coupling, no housing**

 Dimensions in mm  
Projection/First angle

**E/809080 & E/809100**

 #Stroke  
\$ = piston rod extension

Ø	A -1	ØB d11	ØBA g6	BG min	BH	ØDW r7	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	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	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	214,5 ±1	10	50

Ø	RT	SW	TG	VA	VD	WH	ZJ	Model
32	M6	10	32,5 ±0,5	7	6	26 ±1,4	133	E/809032/05*/AXX
								E/809032/10*/AXX
40	M8	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

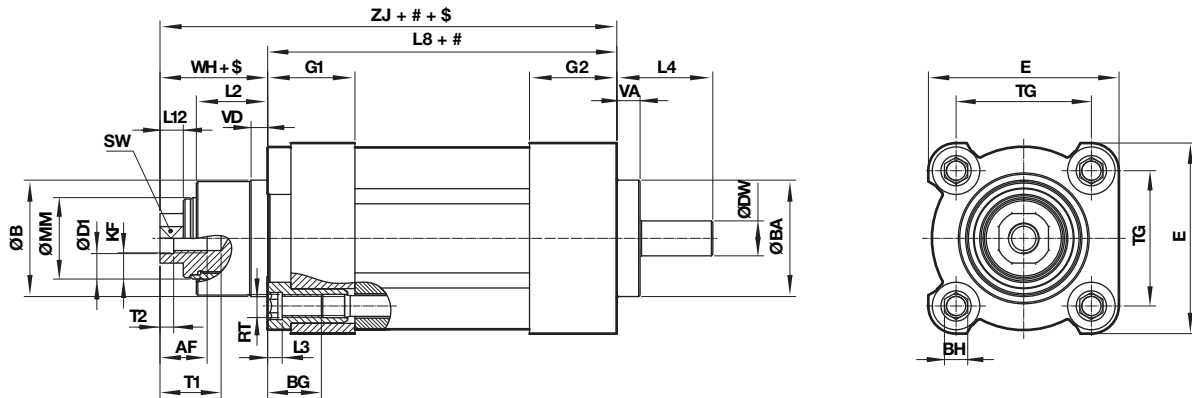
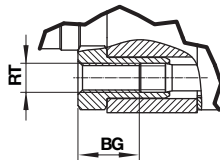
**Weights, moving mass, inertia**  
**E/809000/\*\*M/AXX, E/809000/\*\*U/AXX**  
**Standard cylinder without motor, no coupling, no housing**

Ø	32			40			50		
	5	10	16	5	10	16	5	10	20
Ball screw pitch (mm)	5	10	16	5	10	16	5	10	20
Weight at 0 mm stroke (kg)	0,8061	0,7921	1,2459	1,2565	1,3158	2,0356	2,0684	2,0984	
Weight per 10 mm stroke (kg / mm)	0,0403	0,0406	0,0519	0,054	0,0548	0,0773	0,0781	0,0798	
Moving mass at 0 mm stroke (kg)	0,2687	0,2557	0,3886	0,3872	0,4445	0,6433	0,6691	0,7031	
Moving mass per 10 mm stroke (kg / mm)	0,0126	0,0126	0,0163	0,0163	0,0163	0,0185	0,0185	0,0185	
Rotating mass at 0 mm stroke (kg)	0,144	0,143	0,2647	0,2767	0,2787	0,4635	0,4705	0,4665	
Rotating mass per 10 mm stroke (kg / mm)	0,008	0,008	0,01	0,012	0,013	0,021	0,021	0,023	
Mass moment of inertia at 0 mm stroke (kg mm <sup>2</sup> )	3,4983	5,3972	8,3972	11,413	15,959	24,917	26,493	35,008	
Mass moment of inertia per 10 mm stroke (kg mm <sup>2</sup> / mm)	0,1474	0,1783	0,3002	0,4244	0,5383	1,0673	1,1101	1,3873	
Mass moment of inertia per 1 kg load (kg mm <sup>2</sup> / kg)	0,6333	2,533	0,6333	2,533	6,4846	0,6333	2,533	10,132	

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 0 mm stroke (kg)	3,2157	3,3035	3,3345	5,7883	5,9365	6,0475	6,0405	9,8195	9,8534	9,994	10,18
Weight per 10 mm stroke (kg / mm)	0,0953	0,0959	0,0977	0,1509	0,1509	0,154	0,1551	0,211	0,1979	0,2036	0,2068
Moving mass at 0 mm stroke (kg)	0,9562	1,0379	1,0729	1,8991	2,0323	2,1433	2,1433	3,1122	3,3391	3,4756	3,6582
Moving mass per 10 mm stroke (kg / mm)	0,0215	0,0215	0,0215	0,0315	0,0315	0,0315	0,0315	0,0454	0,0454	0,0454	0,0454
Rotating mass at 0 mm stroke (kg)	0,9645	0,9705	0,9665	1,596	1,611	1,611	1,604	2,772	2,579	2,583	2,586
Rotating mass per 10 mm stroke (kg / mm)	0,035	0,035	0,037	0,057	0,057	0,06	0,061	0,09	0,077	0,082	0,086
Mass moment of inertia at 0 mm stroke (kg mm <sup>2</sup> )	80,416	79,999	94,664	211,96	204,13	226,95	243,13	558,98	503,78	512,54	545,99
Mass moment of inertia per 10 mm stroke (kg mm <sup>2</sup> / mm)	2,8342	2,8199	3,3036	7,5339	7,1741	8,371	9,0622	17,993	14,901	16,354	18,434
Mass moment of inertia per 1 kg load (kg mm <sup>2</sup> / kg)	0,6333	2,533	15,831	0,6333	2,533	10,132	25,938	0,6333	2,533	10,132	40,528



**Basic dimensions  
E/809000/\*\*X/AXX**
**Cylinder with internal piston thread without motor, no coupling, no housing**

 Dimensions in mm  
Projection/First angle

**E/809080 & E/809100**

 #Stroke  
\$ = piston rod extension

Ø	AF <sup>-1</sup>	ØB <sub>d11</sub>	ØBA <sub>g6</sub>	BG <sub>min</sub>	BH	ØD1	ØDW <sub>f7</sub>	E	G1	G2	KF	L2	L3 <sub>max</sub>	L4	L8	L12	ØMM <sub>h9</sub>
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	160 ±0,8	8	32
80	20	55	60	17	19	13	18	95	34	50,5	M12	30,5	–	39	184,5 ±0,8	10	40
100	20	70	72	17	19	13	22	113	41	57,5	M12	33,5	–	45	214,5 ±1	10	50

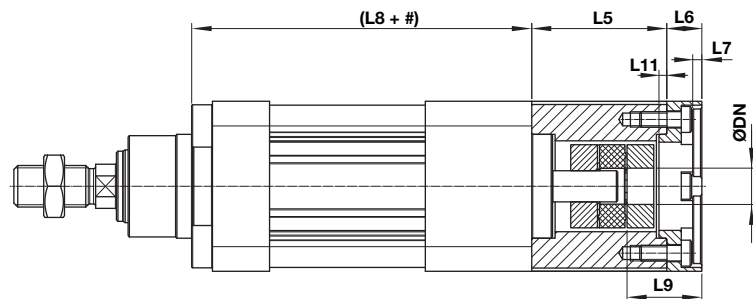
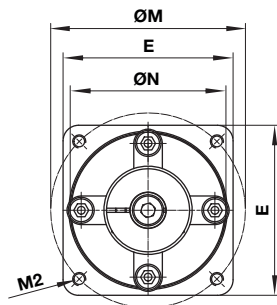
Ø	RT	SW	T1	T2	TG	VA	VD	WH	ZJ	Model
32	M6	10	16	2,6	32,5 ±0,5	7	6	26 ±1,4	133	E/809032/05X/AXX
										E/809032/10X/AXX
40	M8	13	16	3,3	38 ±0,5	7	6	30 ±1,4	160,5	E/809040/05X/AXX
										E/809040/10X/AXX
50	M8	17	21	4,7	46,5 ±0,6	8	6	37 ±1,4	168	E/809050/05X/AXX
										E/809050/10X/AXX
										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

**Basic dimensions**

E/809000/\*\*\*/DX\*

Standard actuator with axial motor mounting kit

Dimensions in mm  
Projection/First angle



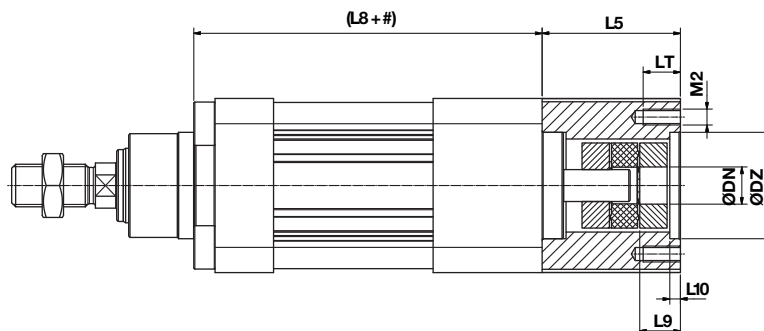
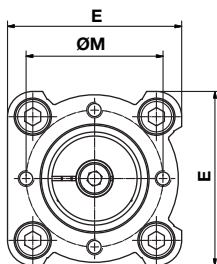
#Stroke

Ø	ØDN H7	E	L5	L6	L7	L9	L11	M2	ØN G7	ØM	Model
32	8	47	39	9	3	19,5	2	M4	30	46	E/809032/***/DX1
	9	53		9	3	19,5	2	M5	40	63	E/809032/***/DX2
40	9	55	42	10	3	20,3	2	M5	40	63	E/809040/***/DX1
	14	65,5		18,5	3,5	28,8	2	M5	60	75	E/809040/***/DX2
50	14	65,5	52	13,5	3,5	28,8	3	M5	60	75	E/809050/***/DX1
63	14	75	61	12	3	29	2	M5	60	75	E/809063/***/DX1
	19	85		22	3,5	39	2	M6	80	100	E/809063/***/DX2
80	14	95	64	13,5	3,5	29,5	3	M5	60	75	E/809080/***/DX1
	19	95		22	3,5	38	3	M6	80	100	E/809080/***/DX2
100	19	115,8	75	14	3,5	39	3	M6	80	100	E/809100/***/DX1
	24	115,8		24	3,5	49	3	M8	110	130	E/809100/***/DX2

**Basic dimensions**

E/809000/\*\*\*/B\*\*

Standard actuator with coupling and housing for customer individual motor



#Stroke

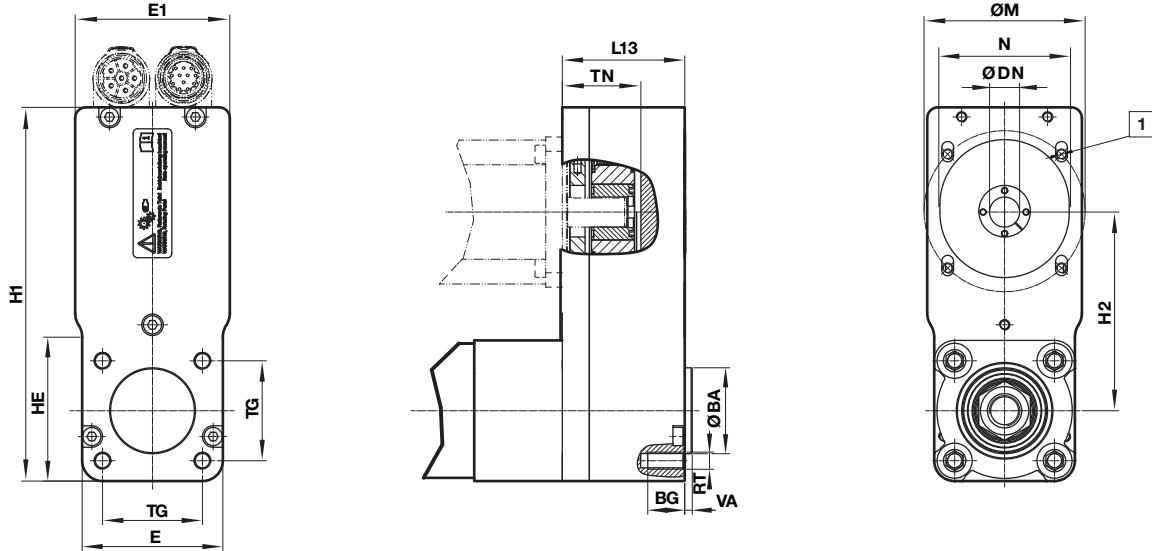
Ø	ØDN H7	ØDZ H7	E	L5	L9	L10	LT	M2	ØM	Model
32	7, 8, 9**	30	47	39	11	3	10	M4	36	E/809032/***/B**
40	9, 12, 14**	37	55	42	10,3	3	10	M4	44	E/809040/***/B**
50	9, 12, 14**	40	65,5	52	15,3	4	14	M6	51,5	E/809050/***/B**
63	14, 18, 19**	50	74,5	61	17	3	14	M6	60	E/809063/***/B**
80	14, 18, 19**	60	95	64	16	4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

\*\* for more versions please contact the technical service.

**Basic dimensions**

E/809000/\*\*\*/NX\*, E/809000/\*\*\*/EX\*, E/809000/\*\*\*/SX\*, E/809000/\*\*\*/WX\*  
 Standard actuator with parallel motor mounting kit

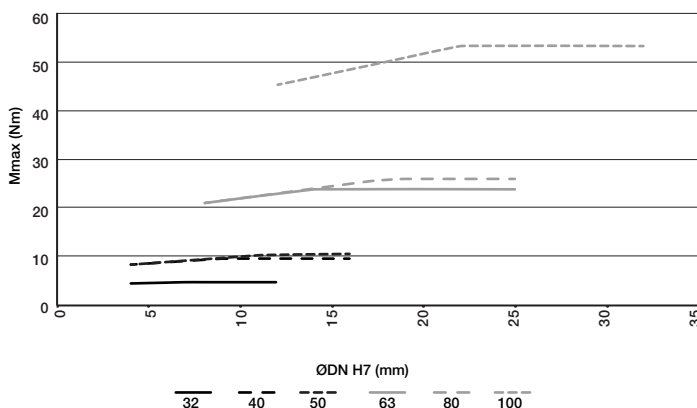
Dimensions in mm  
 Projection/First angle



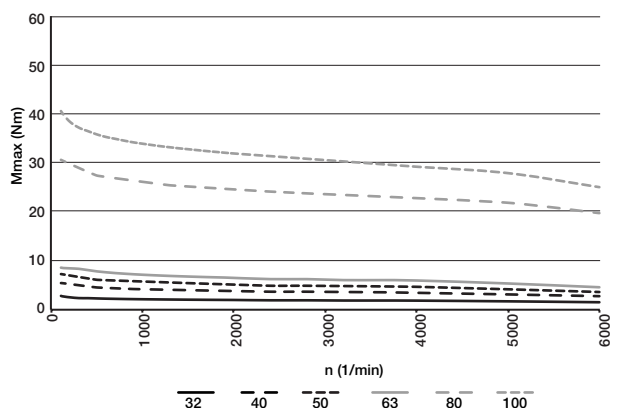
1 M2 - T2 deep

Ø	ØBA d11	BG min	DN	E	E1	H1	H2	HE	L13	M2	ØM	N	RT	T2	TG	TN	VA	Model
32	30	16	8	47	56	130,6	67,5	48	46,5	M4	46	30	M6	11	32,5 ±0,5	max. 28	3,5	E/809032/***/X1
			9							M5	63	40				20 ±0,2		E/809032/***/X2
40	35	16	9	55	72	147,6	72,5	55	52,5	M5	63	40	M6	11	38 ±0,5	max.37	3,5	E/809040/***/X1
			14							M5	75	60				30 ±0,2		E/809040/***/X2
50	40	16	14	65,5	72	174	92,5	67	57	M5	75	60	M8	14	46,5 ±0,6	max. 36	3,5	E/809050/***/X1
63	45	16	14	74,5	89	193	95	76	57	M5	75	60	M8	15	56,5 ±0,7	max. 42	3,5	E/809063/***/X1
			19							M6	100	80				max. 42		E/809063/***/X2
80	45	17	14	95	95	225,5	116	-	63	M5	75	60	M10	16	72 ±0,7	max. 43	3,5	E/809080/***/X1
			19							M6	100	80				max. 43		E/809080/***/X2
100	55	17	19	113	125	279	144	120	68	M6	100	80	M10	19	89 ±0,7	max. 51	3,5	E/809100/***/X1
			24							M8	130	110				max. 51		E/809100/***/X2

**Coupling Graph**



**Toothbelt graph**

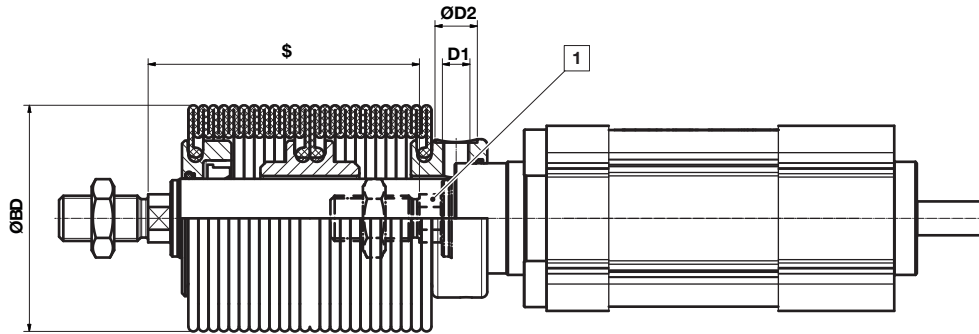


**Basic dimensions**

**E/809000/\*\*G**

**Actuator variant with piston rod bellows**

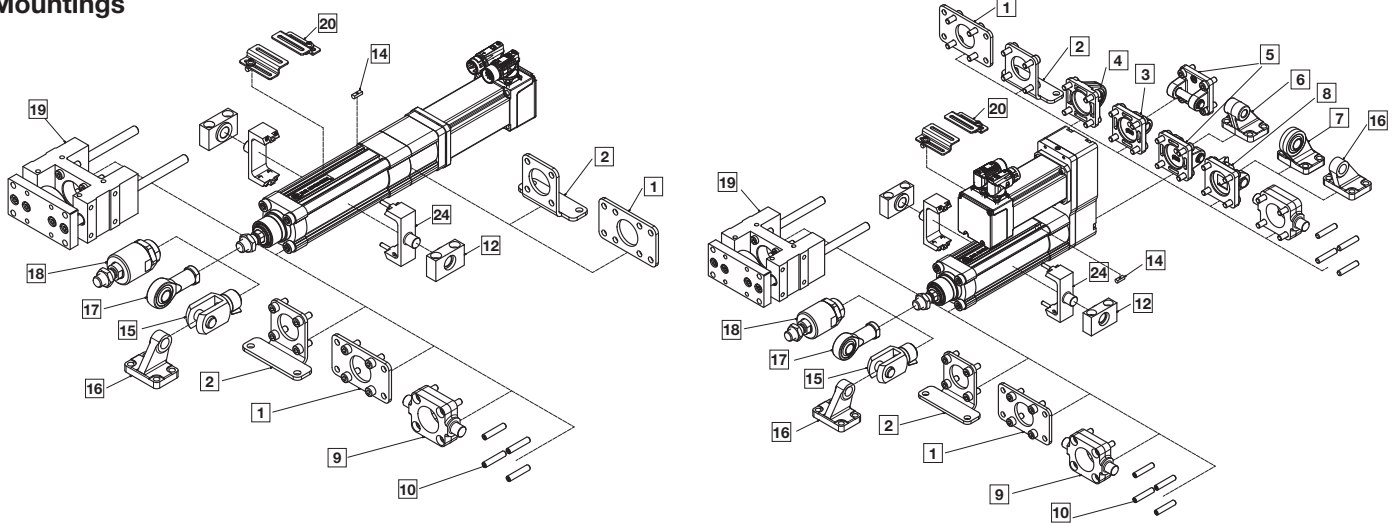
Dimensions in mm  
Projection/First angle









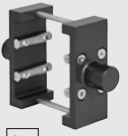










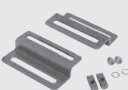
\$ = piston rod extension

1 Piston rod without bellows

Ø	ØBD	D1	ØD2	Piston rod ext. 1. bellows	Piston rod ext. further bellows	Max. stroke per bellows	Model
32	63	M5	9	40	32	145	E/809032/**G/AXX
40	80	G 1/8	15	52	43	250	E/809040/**G/AXX
50	80	G 1/8	15	53	43	250	E/809050/**G/AXX
63	80	G 1/8	15	53	43	250	E/809063/**G/AXX
80	116	G 1/4	19	69	60	350	E/809080/**G/AXX
100	116	G 1/4	19	69	60	350	E/809100/**G/AXX

**Mountings**


Model	A	AK	B, G	C	D	D2	F	FH	UH
									
	<b>10</b>	<b>18</b>	<b>1</b>	<b>2</b>	<b>5</b>	<b>8</b>	<b>15</b>	<b>9</b>	<b>24</b>
<b>Ø</b>	<b>Page 23</b>	<b>Page 23</b>	<b>Page 23</b>	<b>Page 24</b>	<b>Page 24</b>	<b>Page 24</b>	<b>Page 25</b>	<b>Page 25</b>	<b>Page 25</b>
32	QM/8032/35	QM/8025/38	QE/809032/22	QE/809032/21	QA/8032/23	QA/8032/42	QM/8025/25	QA/8032/34	PQA/802032/40
40	QM/8032/35	QM/8040/38	QE/809040/22	QE/809040/21	QA/8040/23	QA/8040/42	QM/8040/25	QA/8040/34	PQA/802040/40
50	QM/8050/35	QM/8050/38	QE/809050/22	QE/809050/21	QA/8050/23	QA/8050/42	QM/8050/25	QA/8050/34	PQA/802050/40
63	QM/8050/35	QM/8050/38	QE/809063/22	QE/809063/21	QA/8063/23	QA/8063/42	QM/8050/25	QA/8063/34	PQA/802063/40
80	QM/8080/35	QM/8080/38	QE/809080/22	QE/809080/21	QA/8080/23	QA/8080/42	QM/8080/25	–	PQA/802080/40
100	QM/8080/35	QM/8080/38	QE/809100/22	QE/809100/21	QA/8100/23	QA/8100/42	QM/8080/25	–	PQA/802100/40


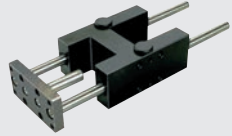
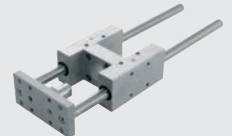
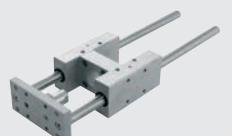
	S	SW	UF	UR	R	SS	US	Groove key	Mounting plate
									
	<b>12</b>	<b>6</b>	<b>17</b>	<b>4</b>	<b>3</b>	<b>16</b>	<b>7</b>	<b>14</b>	<b>20</b>
<b>Ø</b>	<b>Page 26</b>	<b>Page 27</b>	<b>Page 26</b>	<b>Page 26</b>	<b>Page 27</b>	<b>Page 27</b>	<b>Page 28</b>	<b>Page 28</b>	<b>Page 28</b>
32	QA/8032/41	M/P19493	QM/8025/32	QA/8032/33	QA/8032/27	M/P19931	M/P40310	M/P72816	–
40	QA/8040/41	M/P19494	QM/8040/32	QA/8040/33	QA/8040/27	M/P19932	M/P40311	M/P72816	–
50	QA/8040/41	M/P19495	QM/8050/32	QA/8050/33	QA/8050/27	M/P19933	M/P40312	M/P72816	QA/802050/22/54
63	QA/8063/41	M/P19496	QM/8050/32	QA/8063/33	QA/8063/27	M/P19934	M/P40313	M/P72816	QA/802050/22/54
80	QA/8063/41	M/P19497	QM/8080/32	QA/8080/33	QA/8080/27	M/P19935	M/P40314	M/P72816	QA/802080/22/54
100	QA/8100/41	M/P19498	QM/8080/32	QA/8100/33	QA/8100/27	M/P19936	M/P40315	M/P72816	QA/802080/22/54

Pos.	Style	Standard
	B, G	Clear anodised aluminium
	C	Galvanised steel (Ø32 ... 100 mm)
	R	Die-cast aluminium
	UR	Galvanised aluminium Inner ring: steel, Outer ring: brass
	D	Die-cast aluminium Bolt: Galvanised steel (martensitic) Circlip: Galvanised steel
	SW	Die-cast aluminium
	US	Galvanised aluminium Inner ring: steel, Outer ring: brass

Pos.	Style	Standard
	D2	Painted cast iron, Bolt: stainless steel (martensitic), Circlip: Galvanised steel
	FH	Cast iron
	A	Galvanised steel
	S	Clear anodised aluminium Bearing: brass
	Groove key	Steel
	F	Galvanised steel, Bolt: galvanised steel, Circlip: Galvanised steel
	SS	Painted cast iron



Pos.	Style	Standard
	UF	Galvanised steel, Inner ring: steel, Outer ring: brass
	AK	Galvanised steel
	51, 61, 81, 85	Anodised aluminium
	UH	Anodised aluminium

**Guide blocks**

	<b>Guide blocks - plain bearings</b>	<b>Guide blocks - roller bearings</b>	<b>Guide blocks - plain bearings, long coupling</b>	<b>Guide blocks - plain bearings, short coupling</b>
				
	<b>19</b>	<b>19</b>	<b>19</b>	<b>19</b>
<b>Ø</b>	<b>Page 29</b>	<b>Page 30</b>	<b>Page 32</b>	<b>Page 32</b>
32	QA/8032/51/*	QA/8032/61/*	QA/8032/81/*	QA/8032/85/*
40	QA/8040/51/*	QA/8040/61/*	QA/8040/81/*	QA/8040/85/*
50	QA/8050/51/*	QA/8050/61/*	QA/8050/81/*	QA/8050/85/*
63	QA/8063/51/*	QA/8063/61/*	QA/8063/81/*	QA/8063/85/*

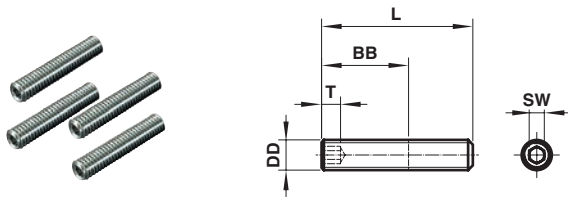
\*) Insert standard stroke length: 100, 160, 200, 250, 320, 400 and 500 mm, use the next bigger standard stroke.

**Magnetically operated switches**

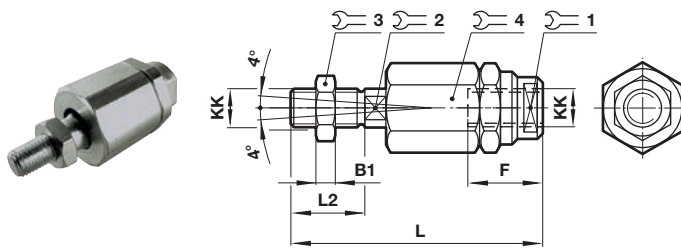
	<b>M/50/**</b>	<b>Groove cover</b>
		
<b>Ø</b>	<b>Page 40</b>	<b>Page 28</b>
32		M/P72725/1000
40		M/P72725/1000
50		M/P72725/1000
63		M/P72725/1000
80		M/P72725/1000
100		M/P72725/1000

	<b>QE/M*</b>
	
<b>□</b>	<b>Page 34</b>
50 (1,05 Nm)	QE/M05530/**
67 (2,45 Nm)	QE/M06730/**
67 (3,50 Nm)	QE/M06730/**
89 (6,90 Nm)	QE/M08930/**
115 (10,50 Nm)	QE/M11530/**

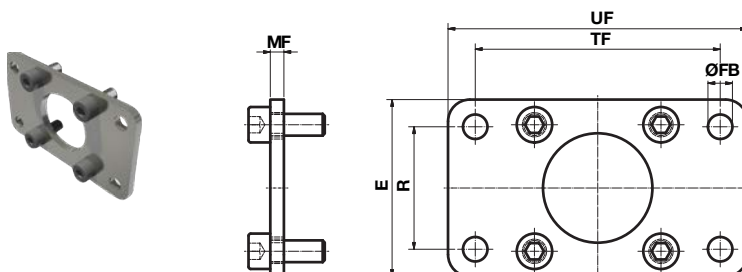
**Mountings**
**Front or rear stud mounting A**

 Dimensions in mm  
Projection/First angle


Ø	BB	DD	L	SW	T <sub>min</sub>	(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				(kg)	F <sub>max</sub> (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

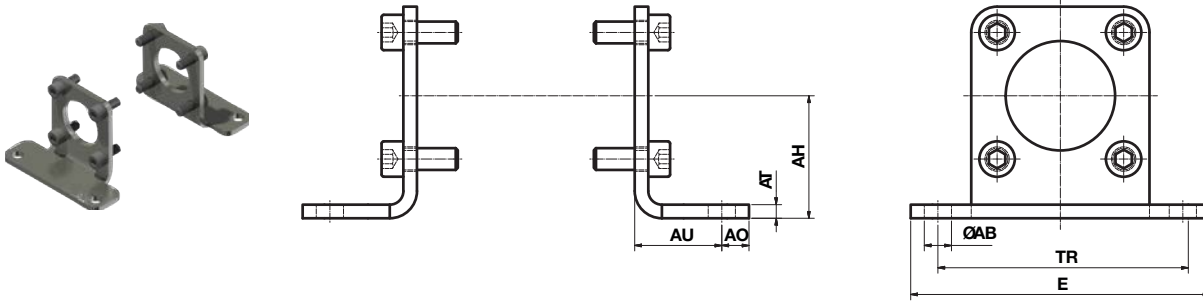
**Front flange B, G**
**Based on ISO 15552,  
type MF1 and MF2**


Ø	E	ØFB	MF	R	TF	UF	(kg)	F <sub>max</sub> (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

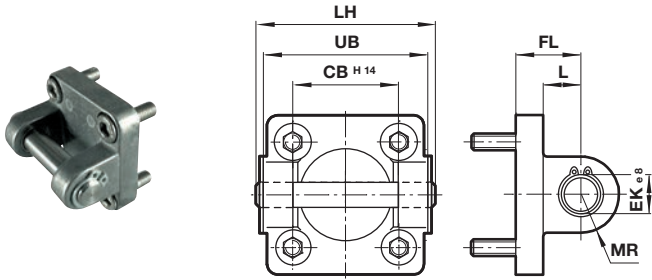
Dimensions in mm  
Projection/First angle



Ø	ØAB	AH	AO	AT	AU	E	TR	(kg)	F <sub>max</sub> (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**

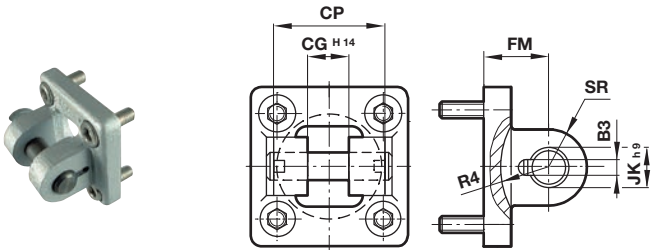
Conforms to ISO 15552, type MP2



Ø	CB H14	ØEK e8	FL	L	LH	MR	UB	(kg)	F <sub>max</sub> (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**

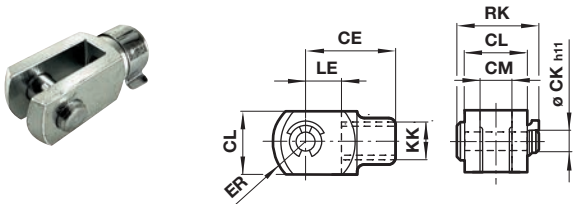
Conforms to ISO 15552, type AB6



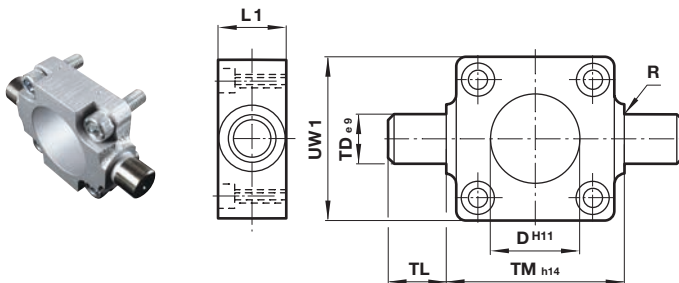
Ø	CG H14	CP	B3	ØJK h9	FM	SR	R4	(kg)	F <sub>max</sub> (N)	Model (D2)
32	14	34	3,3	10	22	11	17	0,20	1.600	QA/8032/42
40	16	40	4,3	12	25	12	20	0,23	2.500	QA/8040/42
50	21	45	4,3	16	27	14,5	22	0,36	3.900	QA/8050/42
63	21	51	4,3	16	32	18	25	0,55	6.200	QA/8063/42
80	25	65	4,3	20	36	22	30	0,90	10.000	QA/8080/42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



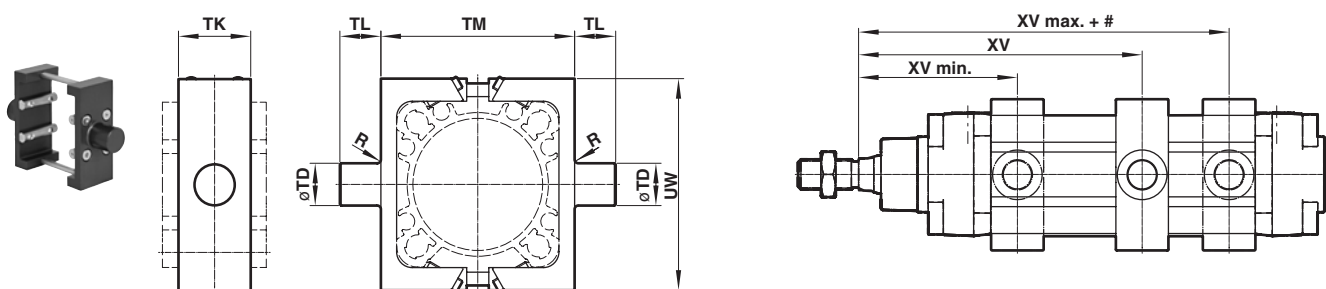
**Piston rod clevis F**  
**Conforms to DIN ISO 8140**

 Dimensions in mm  
 Projection/First angle


Ø	KK	CE	ØCK h11	CL	CM	ER	LE	RK	(kg)	F <sub>max</sub> (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 <sub>max</sub> (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 <sub>max</sub> (N)	Model (UH)
32	1	12	25	12	50	58	65,5	88,5	0,06	1,3	1.600	PQA/802032/40
40	1,6	16	28	16	63	65	71	109,5	0,11	1,3	2.500	PQA/802040/40
50	1,6	16	28	16	75	80	81	113	0,16	4	3.900	PQA/802050/40
63	1,6	20	36	20	90	96	85	130	0,32	4	6.200	PQA/802063/40
80	1,6	20	36	20	110	116	98	162	0,37	6,5	10.000	PQA/802080/40
100	2	25	48	25	132	140	116	184	0,72	6,5	15.700	PQA/802100/40

Style 'UH': It is most important that the locking screws which secure the mounting to the tie rod are tightened to the torque figures shown in the table above.

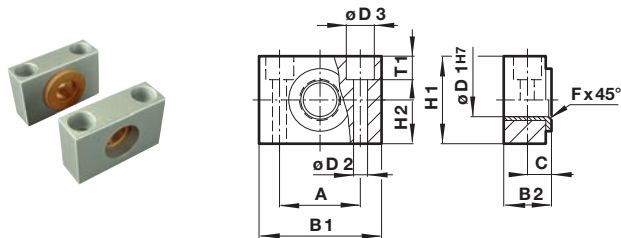
For maximum energy input, consult our Technical Service.

Unless otherwise specified, units will be supplied with dimension 'XV min'. plus half the stroke length. 'XV' = Distance from the piston rod shoulder to the centre of the mounting (Please see drawing).

This item is adjustable and suited to normal loads.

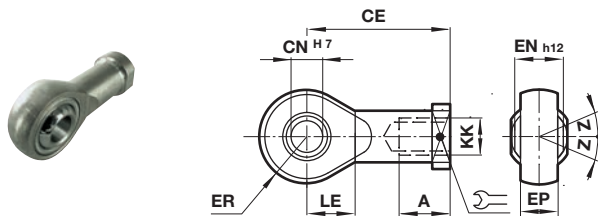
**Trunnion support S**  
Conforms to ISO 15552, type AT4

Dimensions in mm  
Projection/First angle



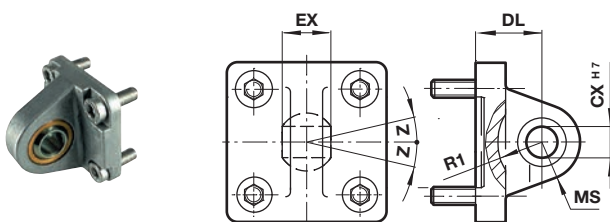
Ø	A	B1	B2	C	ØD1 H7	ØD2	ØD3	F x 45 °	H1	H2	T1	(kg)	Model (S)
32	32	46	18	10,5	12	6,6	11	1	30	15	6,8	0,10	QA/8032/41
40/50	36	55	21	12	16	9	15	1,6	36	18	9	0,14	QA/8040/41
63/80	42	65	23	13	20	11	18	1,6	40	20	11	0,18	QA/8063/41
100	50	75	28,5	16,5	25	14	20	2	50	25	13	0,34	QA/8100/41

**Universal piston rod eye UF**  
Conforms to DIN ISO 8139



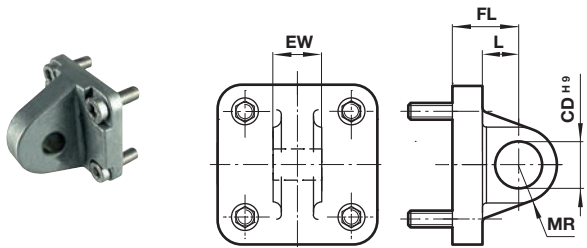
Ø	KK	A	CE	ØCN H7	EN h12	ER	LE	Z	(kg)	F <sub>max</sub> (N)	Model (UF)
32	M10 x 1,25	20	43	10	14	14	15	9 °	0,09	1.600	QM/8025/32
40	M12 x 1,25	22	50	12	16	16	17	13 °	0,13	2.500	QM/8040/32
50/63	M16 x 1,5	28	64	16	21	21	22	15 °	0,33	6.200	QM/8050/32
80/100	M20 x 1,5	33	77	20	25	25	26	15 °	0,67	15.700	QM/8080/32

**Universal rear eye UR**  
Conforms to ISO 15552, type MP6

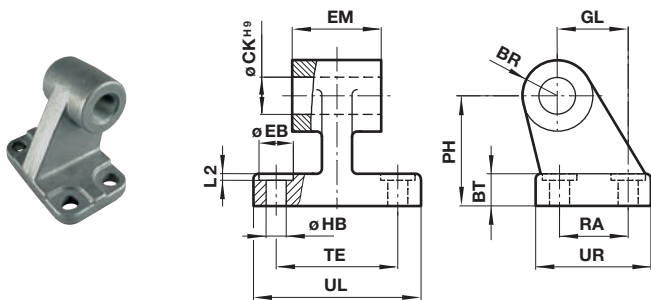


Ø	ØCX H7	EX	MS	DL	R1	Z	(kg)	F <sub>max</sub> (N)	Model (UR)
32	10	14	16	22	13	13 °	0,15	1.600	QA/8032/33
40	12	16	18	25	16	13 °	0,25	2.500	QA/8040/33
50	16	21	21	27	19	15 °	0,40	3.900	QA/8050/33
63	16	21	23	32	22	15 °	0,55	6.200	QA/8063/33
80	20	25	28	36	24	14 °	0,90	10.000	QA/8080/33
100	20	25	30	41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

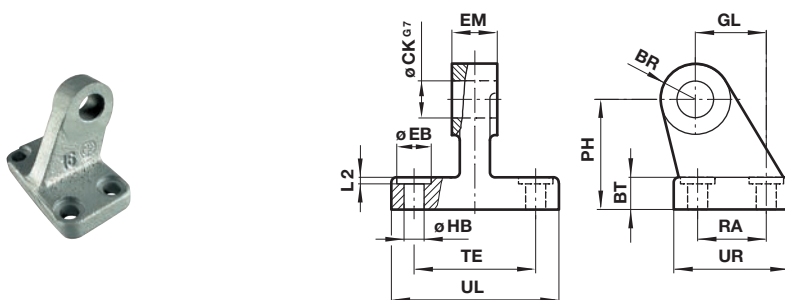
**Rear eye R**  
**Conforms to ISO 15552, type MP4**

 Dimensions in mm  
 Projection/First angle


Ø	ØCD H9	EW	FL	L	MR	(kg)	F <sub>max</sub> (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**


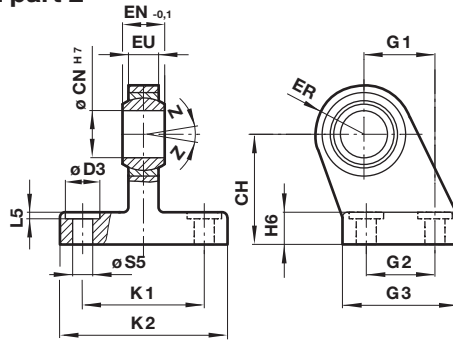
Ø	BR	BT	PH	ØCK H9	ØEB	EM	GL	ØHB	L2	RA	TE	UL	UR	(kg)	Model (SW)
32	10	7	32	10	12	25,6	21	6,6	1,6	18	38	50	31	0,05	M/P19493
40	11	9	36	12	12	27,6	24	6,6	1,6	22	41	53	35	0,07	M/P19494
50	13	11	45	12	15	31,6	33	9	1,6	30	50	65	45	0,14	M/P19495
63	15	11	50	16	15	39,6	37	9	1,6	35	52	67	50	0,18	M/P19496
80	15	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

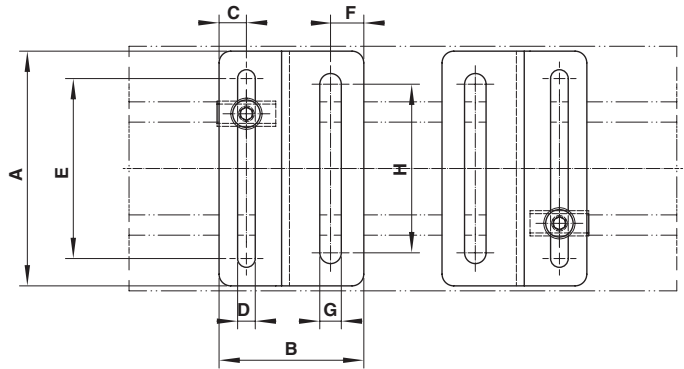
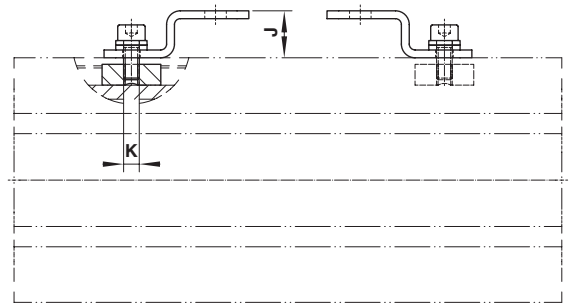
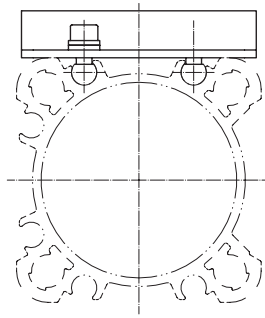
**Swivel hinge US**  
Conforms to VDMA 24562 part 2

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	MP40310
40	36	12	11	16	18	12	24	22	35	10	41	54	1,6	6,6	13 °	0,24	MP40311
50	45	16	15	21	21	15	33	30	45	12	50	65	1,6	9	15 °	0,46	MP40312
63	50	16	15	21	23	15	37	35	50	12	52	67	1,6	9	15 °	0,59	MP40313
80	63	20	18	25	28	18	47	40	60	14	66	86	2,5	11	14 °	1,03	MP40314
100	71	20	18	25	30	18	55	50	70	15	76	96	2,5	11	14 °	1,40	MP40315

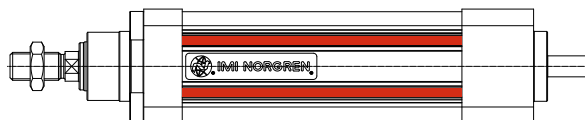
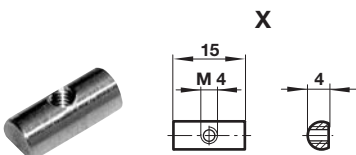
**Mounting kit for profile barrel**



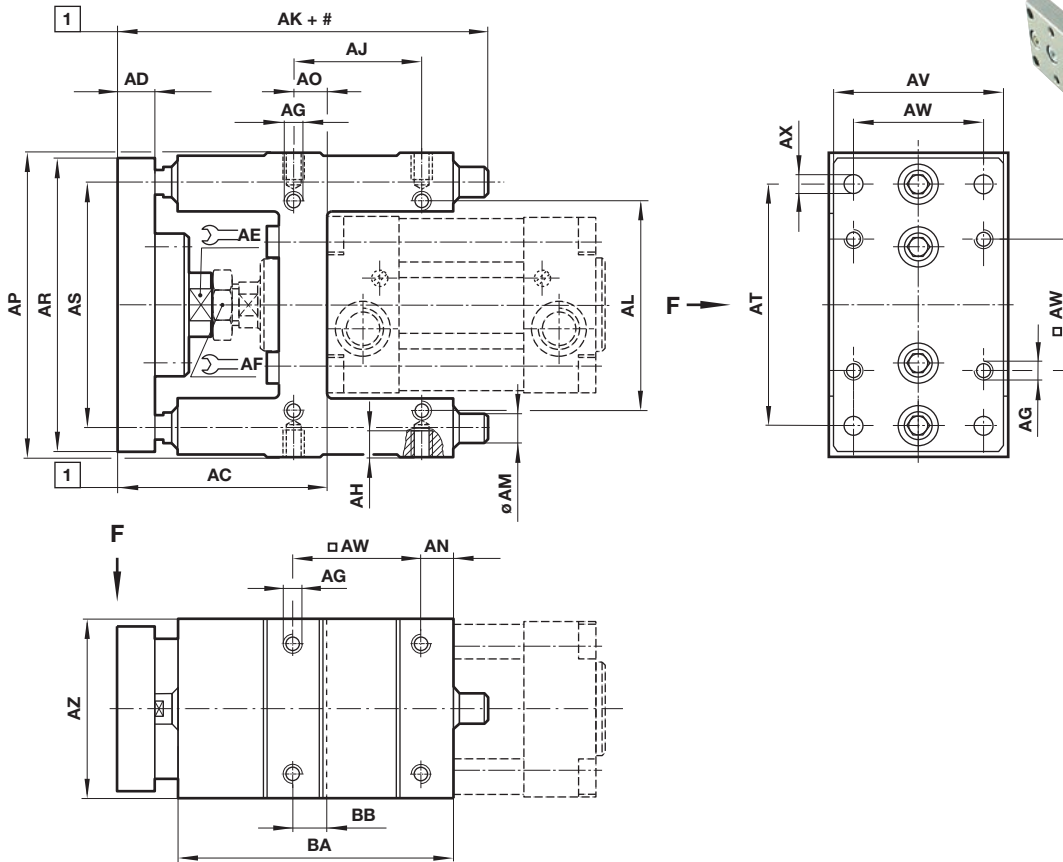
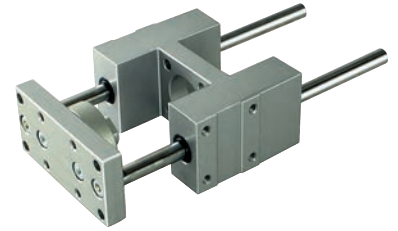
Ø	A	B	C	D	E	F	G	H	J	K	SW	(kg)	Model
50/63	60	37	7	4,5	46	8,5	5,5	43	12	M4	3	0,08	PQA/802050/22/54
80/100	90	37	7	4,5	76	8,5	6,5	70	12	M4	3	0,11	PQA/802080/22/54

**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

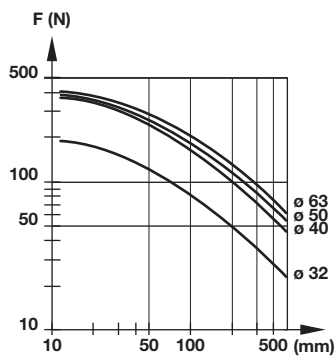
Ø	AC	AD	AE	AF	AG	AH	AJ	AK	AL	ØAM	AN	AO	AP
32	69	12	15	17	M 6	10	32,5	110	58	10	6	9	100
40	74	12	15	19	M 6	10	38	122	64	12	6	11	106
50	91,5	15	22	24	M 8	12	46,5	135	80	12	6	19	125
63	92	15	22	24	M 8	12	56,5	153	95	12	7	15	132

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/*

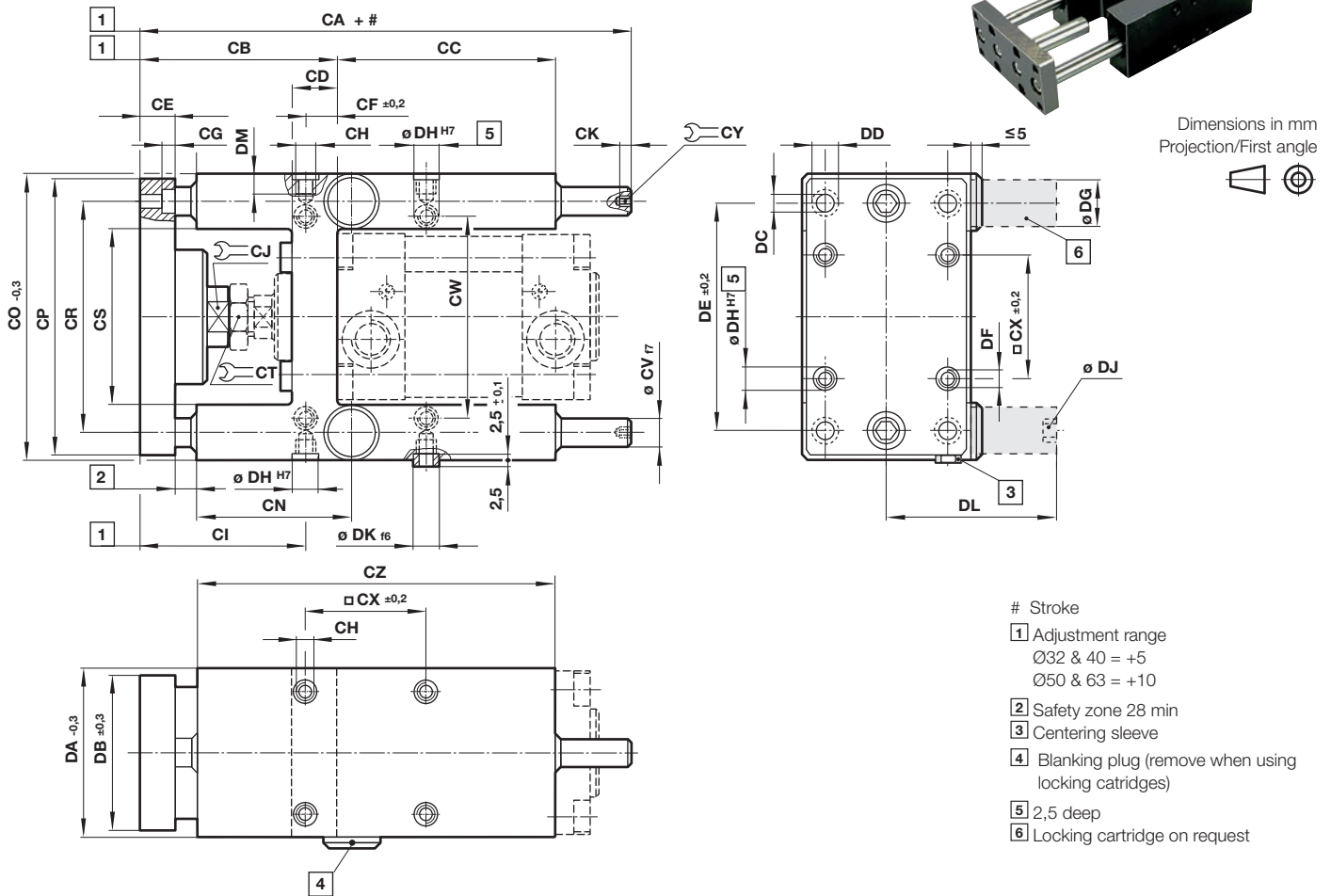
\* Insert standard stroke length: 50, 100, 160, 200, 250, 320, 400 and 500 mm, use nearest standard stroke.

Note: Supplied complete with mounting screws for cylinders

Maximum load



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



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	M 6	84,5	13	5	61	97
40	192	111	69	33	12	23	6,5	M 6	88	15	6	67	115
50	237	128	65	40	15	33,8	9	M 8	94	22	6	75,5	137
63	237	128	97	40	15	29,3	9	M 8	98,5	22	6	80	152

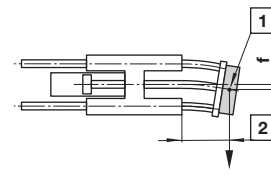
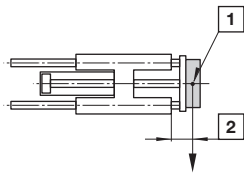
Ø	CP	CR	CS	CT	ØCV F7	CW	CX ±0,2	CY	CZ	DA -0,3	DB ±0,3	DC	ØDD
32	90	74	50,5	17	12	61	32,5	5	125	50	45	6,6	11
40	110	87	58,5	19	16	69	38	6	140	58	54	6,6	11
50	130	104	70,5	24	20	85	46,5	6	150	70	63	9	15
63	145	119	85,5	24	20	100	56,5	6	182	85	80	9	15

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	M 6	20	9	M 5	9	45	14	1,2	0,18	600	QA/8032/63	QA/8032/61/*
40	84	M 6	24	9	G1/8	9	61,5	14	2,2	0,32	1000	QA/8040/63	QA/8040/61/*
50	100	M 8	30	11	G1/8	11	76,5	16	3,6	0,49	1500	QA/8050/63	QA/8050/61/*
63	105	M 8	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

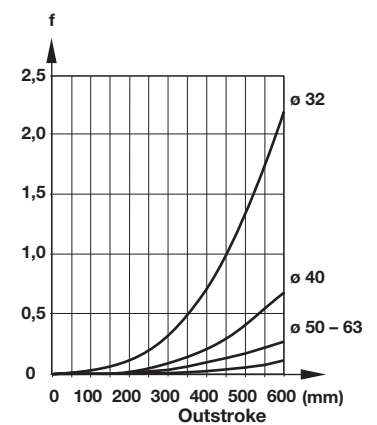
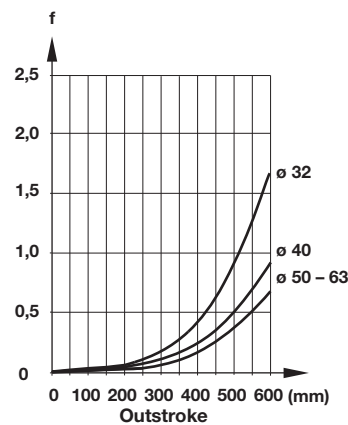
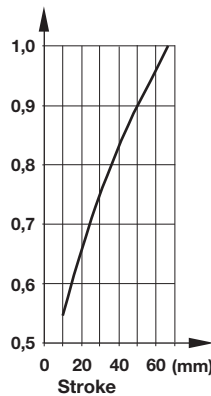
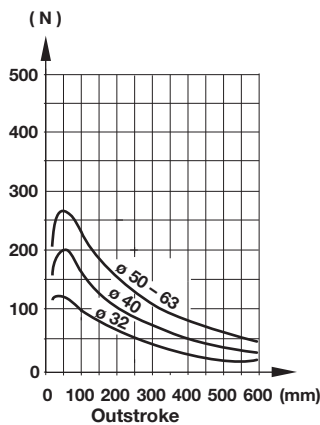
\*1) Locking cartridges should be ordered separately. Passive - pressure to unlock. Two required per guide block.

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

 Dimensions in mm  
Projection/First angle


- 1 Centre of gravity load capacity
- 2 Outstroke

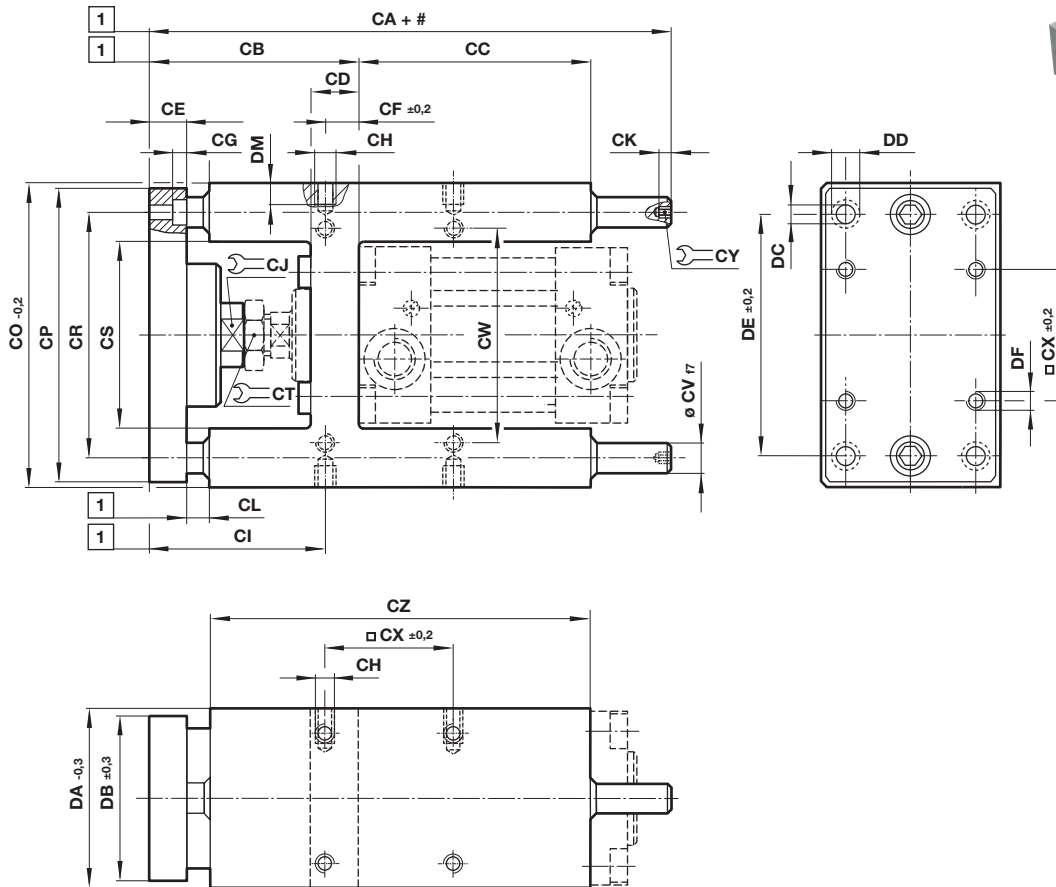
Maximum load capacity is dependent on the outstroke of a horizontally installed guide unit. In the case of short stroke operation, the load capacity figures taken from the diagram must be multiplied by the correction factor (diagram 2). In the curves of load capacity (diagram 1), the short stroke corrections 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)**
**Deflection caused by own weight  
(diagram 2)**
**Deflection caused by a load of 10 N  
(diagram 4)**
**Load capacity**
**Correction factor**
**Deflection (mm)**
**Deflection (mm)**


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

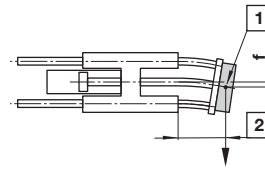
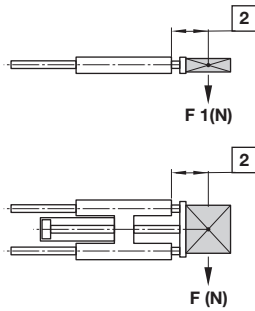
  

Ø	DA ±0,2	DB ±0,3	ØDC	ØDD	DE ±0,2	DF	DM	(kg) /81 at 0 mm	(kg) /85 at 0 mm	(kg) /81; /85 per 100 mm	Model /81	Model /85
32	49	45	6,6	11	78	M 6	12	1,2	1,15	0,18	QA/8032/81	QA/8032/85
40	58	55	6,6	11	84	M 6	12	2,2	2,15	0,32	QA/8040/81	QA/8040/85
50	70	65	9	15	100	M 8	16	3,6	3,55	0,49	QA/8050/81	QA/8050/85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

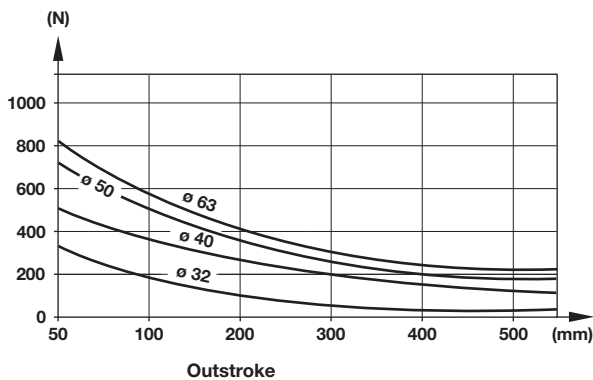
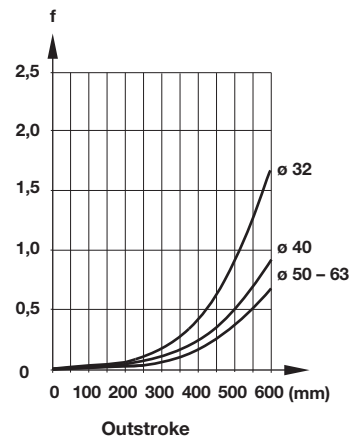
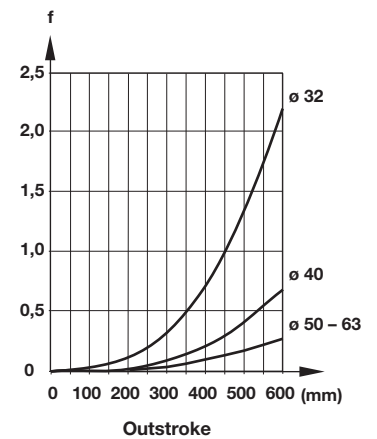
 Dimensions in mm  
Projection/First angle


- 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  
Deflection caused by a load of 10 N  
(diagram 1)**
**Load capacity**

**Deflection caused by own weight  
(diagram 2)**
**Deflection (mm)**

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


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

- > Compact servo motor with high dynamics
- > Patented rotor technology
- > Holding brake available
- > Very high torque is required during rapid acceleration and deceleration profiles
- > IP65
- > Torques from 1,05 Nm up to 10,5 Nm
- > Optimised for pulse-duty application (300% overload)
- > 300 V Single-phase and three-phase and 400 V three-phase
- > Two different feedback systems ( Resolver or Absolute (Multi turn))



### Technical features

**Voltage:**

200 ... 400 VAC

**Current:**

1 ... 9 A

**Power:**

0,16 ... 3,3 kW

**Ambient temperature:**

0 °C ... 40 °C (32 °F ... 104 °F)

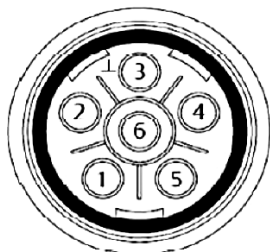
**Humidity:**

0 ... 95%

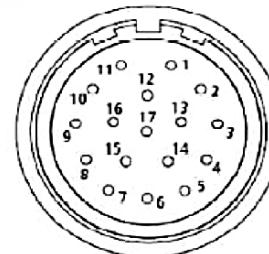
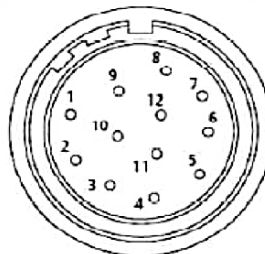
**IP Protection rate:**

IP65

### Plug in for motor cable



### Plug in for feedback cable



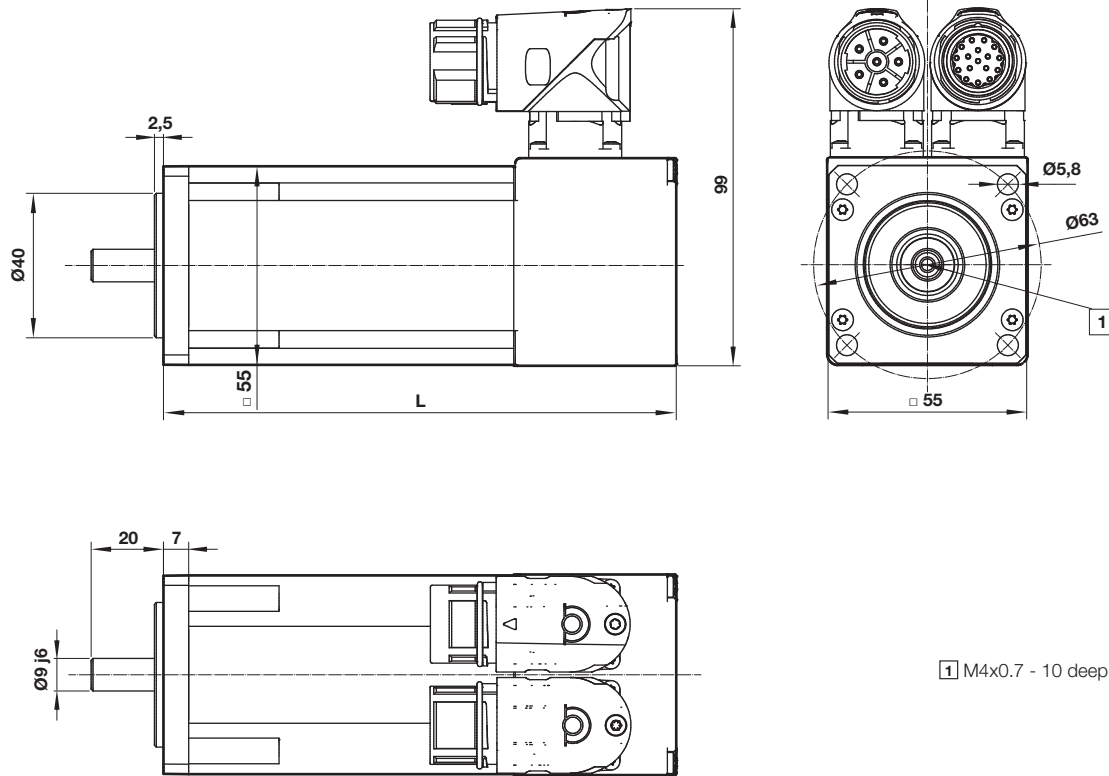
Pin	Function with holding brake	Function without holding brake
1	Phase U (R)	Phase U (R)
2	Phase V (S)	Phase V (S)
3	Ground	Ground
4	Phase W (T)	Phase W (T)
5	Brake +24 V	
6	Brake 0 V	
Shell	Screen	Screen

Pin	Function Resolver	Function Absolute (Multi turn)
1	Excitation High	Thermistor
2	Excitation Low	Thermistor
3	Cos High	Screen (Optical only)
4	Cos Low	
5	Sin High	
6	Sin Low	
7	Thermistor	
8	Thermistor	+ Clock
9		- Clock
10		
11		+ Data
12		- Data
13		- Cos
14		
15		
16		
17		0 Volts
Body	Screen	Screen

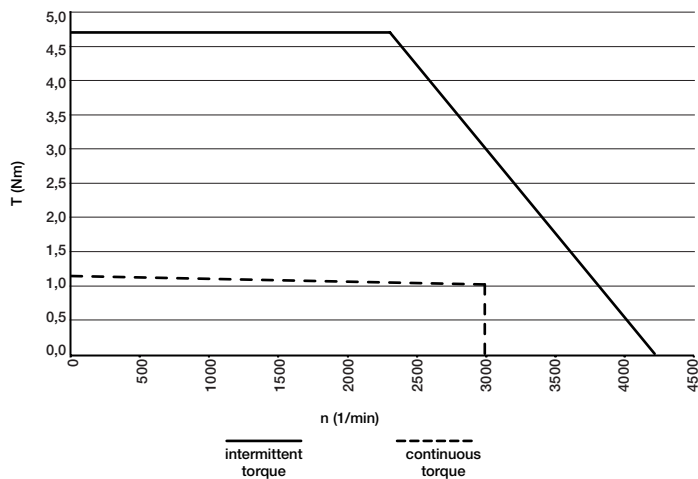
For further information please visit:

<http://acim.nidec.com/drives/control-techniques/downloads/user-guides-and-software/unimotorhd>

**Motor QE/M05530/\***

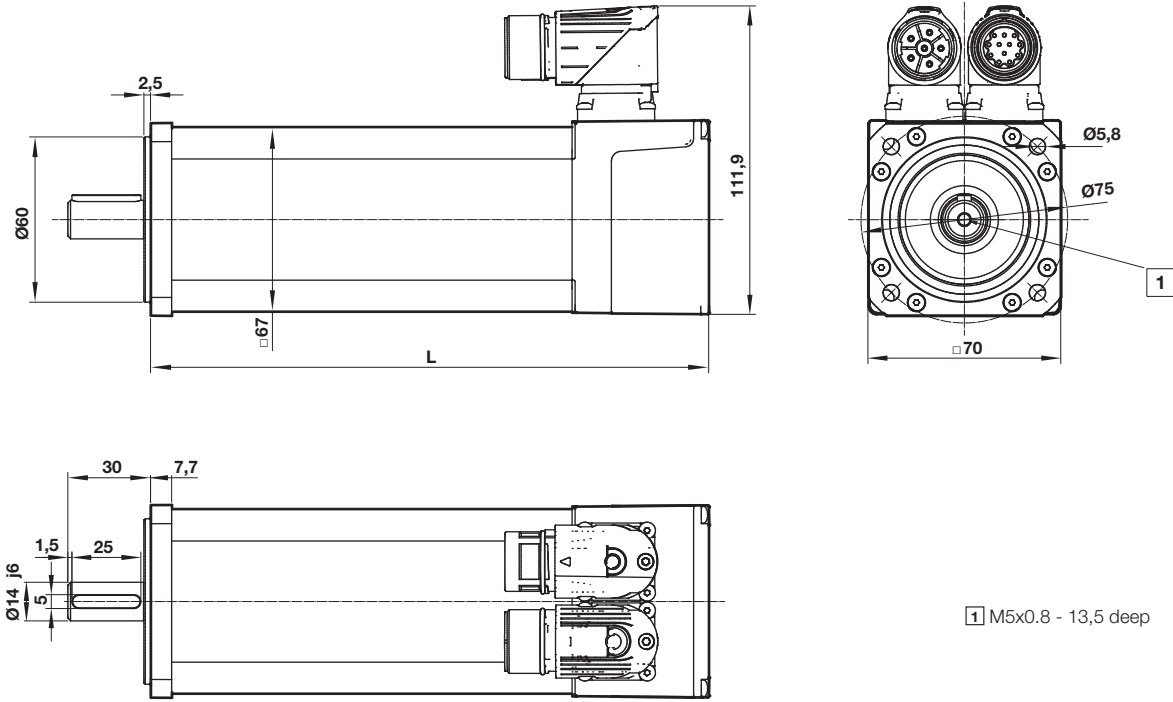
 Dimensions in mm  
Projection/First angle


Motor-code	Feedback system	Rated torque at 12 kHz (Nm)	Rated speed (rpm)	Rated power (kW)	Stall current (A)	Motor stall torque (Nm)	Motor peak torque (Nm)	Inertia (kg m <sup>2</sup> )	Brake	L (mm)	Weight (kg)	Nidec reference number	Model
EA	Resolver	1,05	3000	0,33	0,79	1,18	4,72	0,000025	-	142	1,5	055UDB300BAARA063090	QE/M05530/EA/09
EB	Absolute (Multi turn)	1,05	3000	0,33	0,79	1,18	4,72	0,000025	-	142	1,5	055UDB300BAEMA063090	QE/M05530/EB/09
EM	Resolver	1,05	3000	0,33	0,79	1,18	4,72	0,000025	x	142	1,9	055UDB305BAARA063090	QE/M05530/EM/09
EN	Absolute (Multi turn)	1,05	3000	0,33	0,79	1,18	4,72	0,000025	x	142	1,9	055UDB305BAEMA063090	QE/M05530/EN/09

**QE/M05530/E\***


Motor QE/M06730/\*

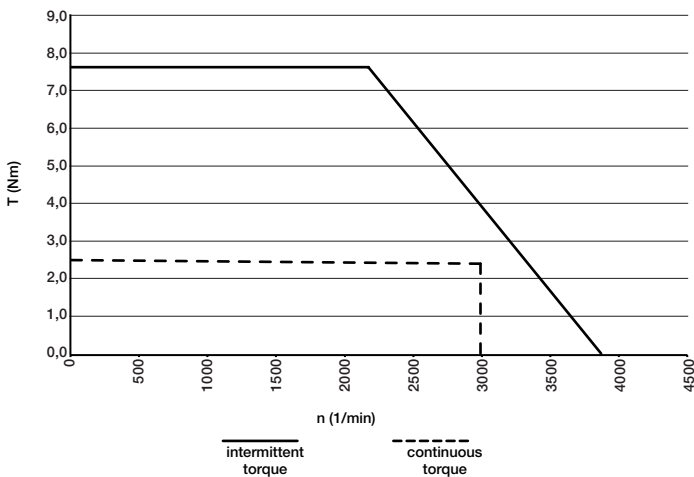
Dimensions in mm  
Projection/First angle



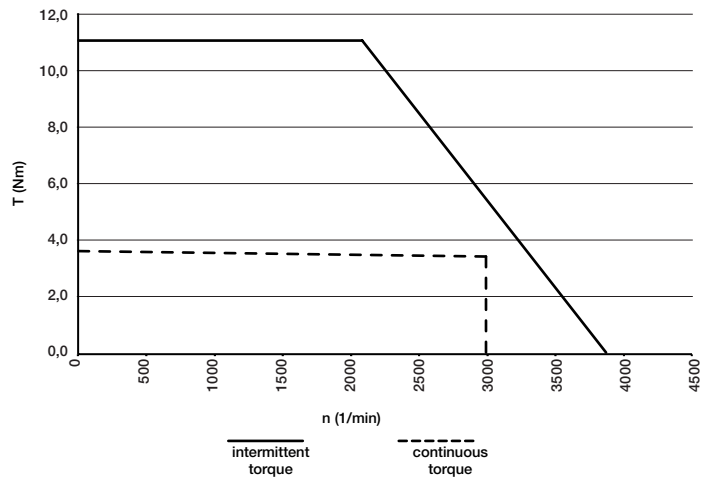
1 M5x0.8 - 13,5 deep

Motor-code	Feedback system	Rated torque at 12 kHz (Nm)	Rated speed (rpm)	Rated power (kW)	Stall current (A)	Motor stall torque (Nm)	Motor peak torque (Nm)	Inertia (kg m <sup>2</sup> )	Brake	L (mm)	Weight (kg)	Nidec reference number	Model
JA	Resolver	2,45	3000	0,77	1,59	2,55	7,65	0,000053	-	172,7	2,6	067UDB300BAARA	QE/M06730/JA/14
JB	Absolute (Multi turn)	2,45	3000	0,77	1,59	2,55	7,65	0,000053	-	172,7	2,6	067UDB300BAEMA	QE/M06730/JB/14
JM	Resolver	2,45	3000	0,77	1,59	2,55	7,65	0,000053	x	207,7	3,3	067UDB306BAARA	QE/M06730/JM/14
JN	Absolute (Multi turn)	2,45	3000	0,77	1,59	2,55	7,65	0,000053	x	207,7	3,3	067UDB306BAEMA	QE/M06730/JN/14
NA	Resolver	3,50	3000	1,10	2,31	3,70	11,10	0,000075	-	202,7	3,2	067UDC300BAARA	QE/M06730/NA/14
NB	Absolute (Multi turn)	3,50	3000	1,10	2,31	3,70	11,10	0,000075	-	202,7	3,2	067UDC300BAEMA	QE/M06730/NB/14
NM	Resolver	3,50	3000	1,10	2,31	3,70	11,10	0,000075	x	237,7	3,8	067UDC306BAARA	QE/M06730/NM/14
NN	Absolute (Multi turn)	3,50	3000	1,10	2,31	3,70	11,10	0,000075	x	237,7	3,8	067UDC306BAEMA	QE/M06730/NN/14

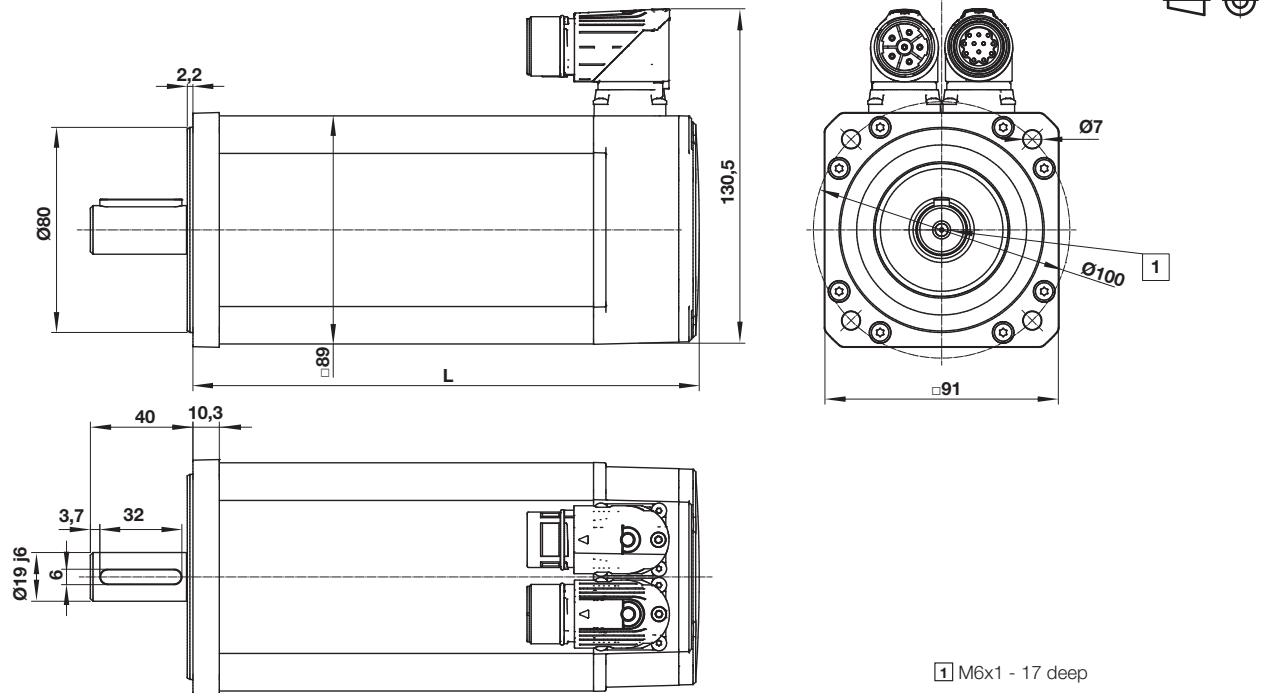
QE/M06730/J\*



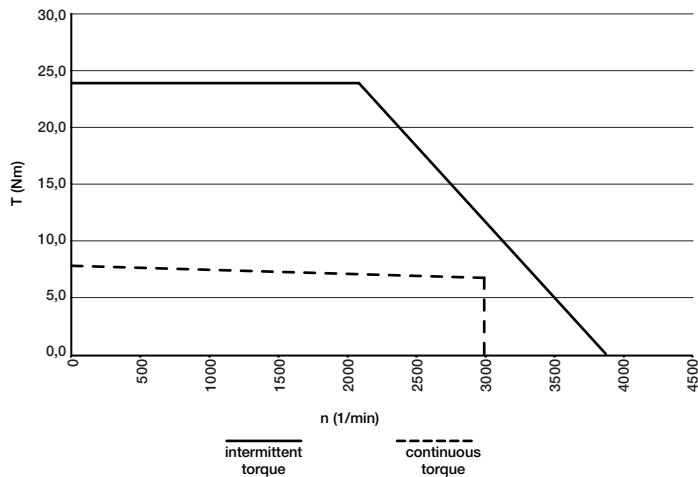
QE/M06730/N\*



**Motor QE/M08930/\***

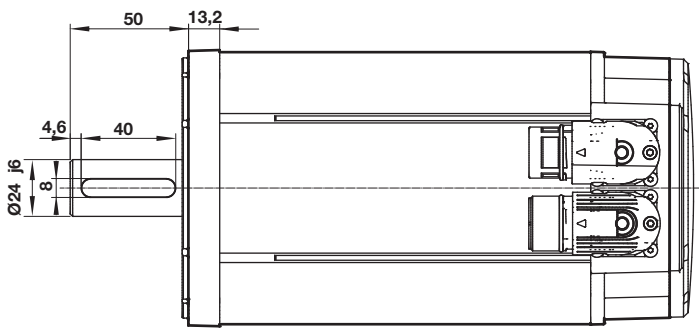
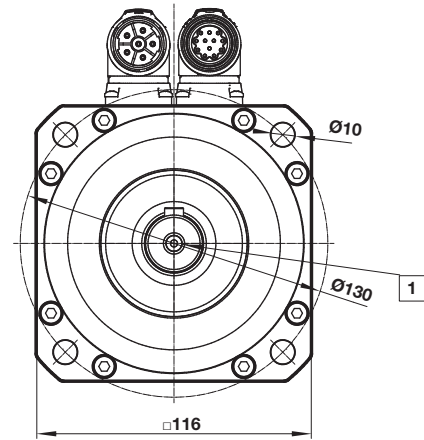
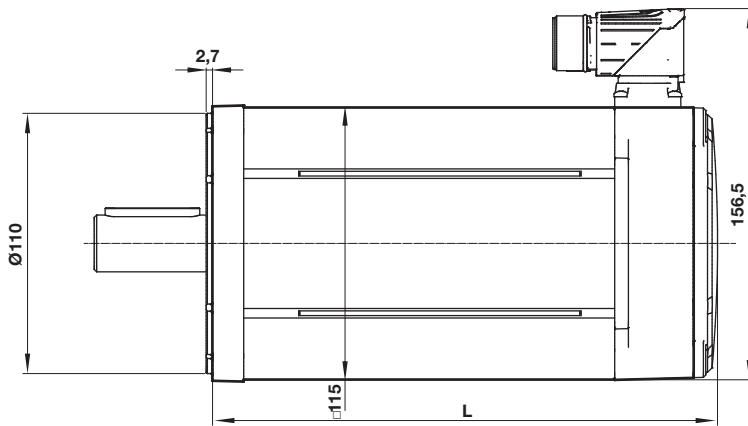
 Dimensions in mm  
Projection/First angle


Motor-code	Feedback system	Rated torque at 12 kHz (Nm)	Rated speed (rpm)	Rated power (kW)	Stall current (A)	Motor stall torque (Nm)	Motor peak torque (Nm)	Inertia (kg m <sup>2</sup> )	Brake	L (mm)	Weight (kg)	Nidec reference number	Model
RA	Resolver	6,90	3000	2,17	5,0	8,0	24,0	0,000234	-	197,8	5,5	089UDC300BAAEA	QE/M08930/RA/19
RB	Absolute (Multi turn)	6,90	3000	2,17	5,0	8,0	24,0	0,000234	-	207,8	5,5	089UDC300BAECA	QE/M08930/RB/19
RM	Resolver	6,90	3000	2,17	5,0	8,0	24,0	0,000234	x	237,9	6,5	089UDC306BAAEA	QE/M08930/RM/19
RN	Absolute (Multi turn)	6,90	3000	2,17	5,0	8,0	24,0	0,000234	x	247,9	6,5	089UDC306BAECA	QE/M08930/RN/19

**QE/M08930/R\***


**Motor QE/M11530/\***

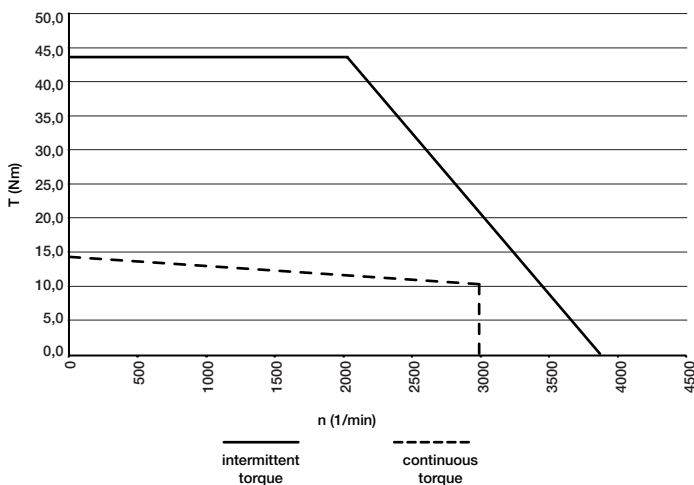
Dimensions in mm  
Projection/First angle



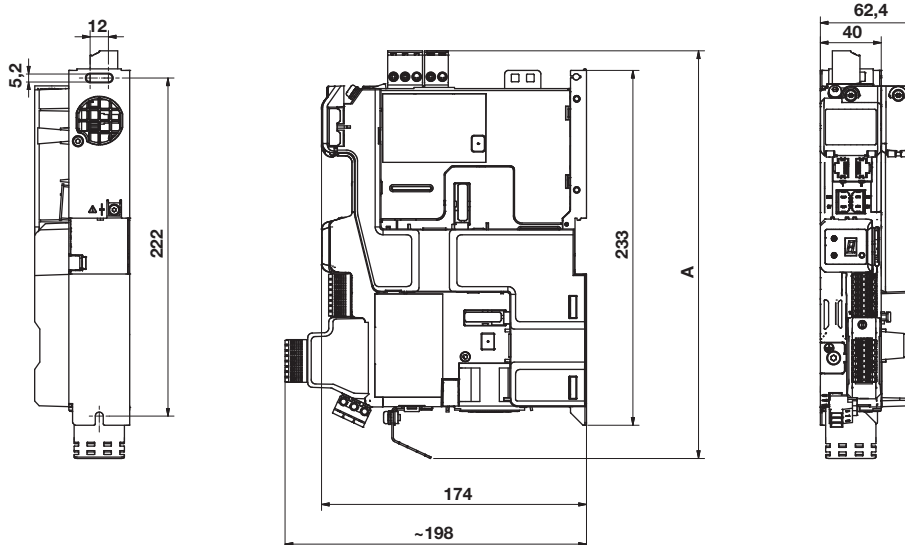
1 M8x1.25 - 20 deep

Motor-code	Feedback system	Rated torque at 12 kHz (Nm)	Rated speed (rpm)	Rated power (kW)	Stall current (A)	Motor stall torque (Nm)	Motor peak torque (Nm)	Inertia (kg m <sup>2</sup> )	Brake	L (mm)	Weight (kg)	Nidec reference number	Model
WA	Resolver	10,50	3000	3,3	9,13	14,6	43,8	0,000639	-	213,8	8,9	115UDC300BAAEA	QE/M11530/WA/24
WB	Absolute (Multi turn)	10,50	3000	3,3	9,13	14,6	43,8	0,000639	-	223,8	8,9	115UDC300BAECA	QE/M11530/WB/24
WM	Resolver	10,50	3000	3,3	9,13	14,6	43,8	0,000639	x	250,9	10,4	115UDC306BAAEA	QE/M11530/WM/24
WN	Absolute (Multi turn)	10,50	3000	3,3	9,13	14,6	43,8	0,000639	x	260,9	10,4	115UDC306BAECA	QE/M11530/WN/24

**QE/M11530/W\***



- > 2 Compact drive frame sizes with maximum performance
- > Onboard Advanced Motion Controller for distributed 1.5 axis motion control
- > Integrated Dual Safe Torque Off - "SIL3 and PLe"
- > Option module flexibility
- > Drives available with EtherCAT, PROFINET, PROFIBUS, EtherNet/IP, DeviceNet & CANopen communications
- > Built-in RS485 communications
- > SD Card slot



Description	A	Line supply (VAC)	Current (V)	max. Power (kW)	Rated current (A)	max. Peak current (A)	max. output frequency (Hz)	Overload closed loop	Overload open loop	Nidec reference number	Standard model drive
Standard drive with internal Bus-system (for motor size □55 - 67)	~ 268	three-phase 380 ... 480 (±10%) at 45 ... 66 Hz	400	6,5	3	9	599	300% for 0,25 s or 200% for 4 s	150% for 8 s	M751-01400030A10100AB110	QE/D01400030
Standard drive with internal Bus-system (for motor size □89 - 115)	~ 313		400	8,7	10,5	31,5	599	300% for 0,25 s or 200% for 4 s	150% for 8 s	M751-02400105A10100AB110	QE/D02400105

For further information please visit:

<http://acim.nidec.com/drives/control-techniques/downloads/user-guides-and-software/digitax-hd>

- > 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 (U<sub>b</sub>):**

10 ... 240 VAC/170 VDC

**Switching voltage output:**

U<sub>b</sub> - 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:

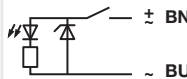
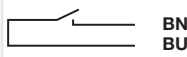
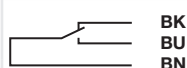
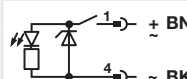
EN 60947-5-2

**Materials:**

Body: plastic

Cable: see table below

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

Symbol	Voltage (VAC)	Voltage (VDC)	Current maximum (mA)	Function	Operating temperature (°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)

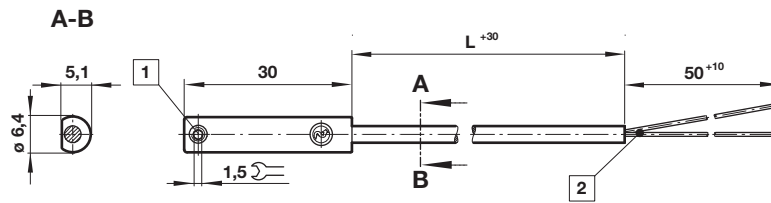
\* Insert cable length; \*1) Plug-in connector see page 39



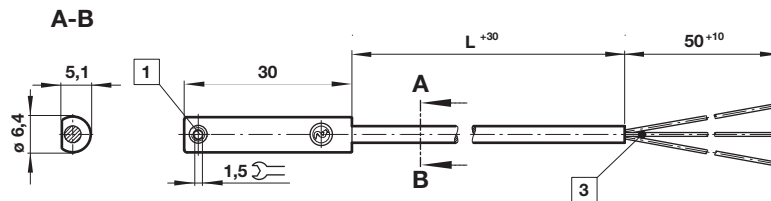
**Dimensions**

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

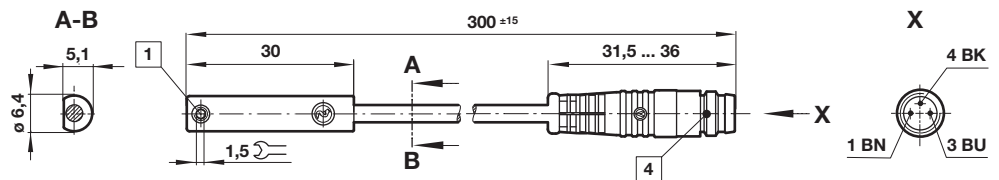
Dimensions in mm  
Projection/First angle



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



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



- 1 Fixing screw
- 2 + BN = brown; - BU = blue (output)
- 3 - BK = black; + BN = brown; - BU = blue
- 4 Version CP: Plug M8 x 1, color code: BK = +; BN = -; BU = output  
Version CC: Plug M12 x 1, color code: BK = +; BN = -; BU = output

**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 solid state switch - 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
- > CE certified
- > UL listed



 IO-Link



**Technical features**

**Operation:**

M/50/EAP (PNP) open collector output with LED (yellow)  
M/50/EAN (NPN) grounded emitter output with LED (yellow)  
M/50/IOP (PNP) Easy IO-Link open collector output with LED (yellow)

**Switching voltage (U<sub>b</sub>):**

10 ... 30 VDC

**Switching voltage output:**

U<sub>b</sub> - 2 V

**Inducted voltage:**

0,5 V

**Switching current**

(see graph overleaf):

100 mA max.

**Switching power:**

3,0 W max.

**Response time:**

< 0,5 ms for EAP switch

< = 1 ms for IOP switch

**Operating frequency:**

1 kHz

**Protection rating (EN 60529):**

IP67 (standard)

IP68 for type: M/50/EAP/5U

**Operating temperature:**

-40 ... +80 °C (-40 ... 176 °F)

(IP67 & IP68)

**Cable type:**

PVC 3 x 0,12 (standard)

PUR 3 x 0,14 (M/50/EAP/5U)

**Cable length:**

2, 5 and 10 m

**Electromagnetic compatibility**

according to:

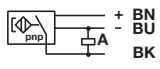
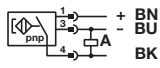
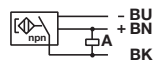
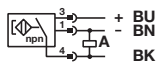
EN 60947-5-2

**Materials:**

Body: plastic

Cable: see table below

**Technical data - Solid state**

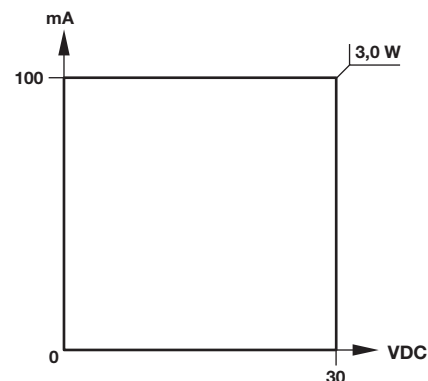
Symbol	Voltage (VDC)	Current maximum (mA)	Function	IO-Link *2)	Operating temperature (°C)	LED	Protection class	Plug	Cable length (m)	Cable type	Weight (g)	Model
	10 ... 30	100	PNP		-40 ... +80	•	IP67	—	2, 5 or 10	PVC 3 x 0,12	37	M/50/EAP/*V
	10 ... 30	100	PNP	•	-40 ... +80	•	IP67	—	5	PVC 3 x 0,12	37	M/50/IOP/5V
	10 ... 30	100	PNP		-40 ... +80	•	IP68	—	5	PUR 3 x 0,14	37	M/50/EAP/5U
	10 ... 30	100	PNP		-40 ... +80	•	IP67	M8 x 1	0,3	PVC 3 x 0,14	16	M/50/EAP/CP *1)
	10 ... 30	100	PNP	•	-40 ... +80	•	IP67	M8 x 1	0,3	PVC 3 x 0,14	16	M/50/IOP/CP *1)
	10 ... 30	100	PNP		-40 ... +80	•	IP67	M12 x 1	0,3	PVC 3 x 0,14	16	M/50/EAP/CC *1)
	10 ... 30	100	NPN		-40 ... +80	•	IP67	—	2, 5 or 10	PVC 3 x 0,12	37	M/50/EAN/*V
	10 ... 30	100	NPN		-40 ... +80	•	IP67	M8 x 1	0,3	PVC 3 x 0,14	16	M/50/EAN/CP *1)

\* Insert cable length; \*1) Plug-in connector below; Color code: BK = black, BN = brown, BU = blue

**IO-Link function \*2)**

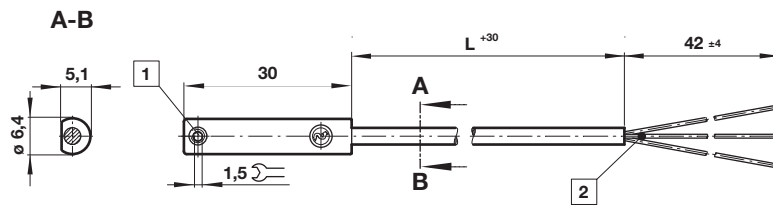
- Visual installation aid
- Counter
- Temperature diagnostic
- Power LED

**Switching current and switching voltage**



**Dimensions**

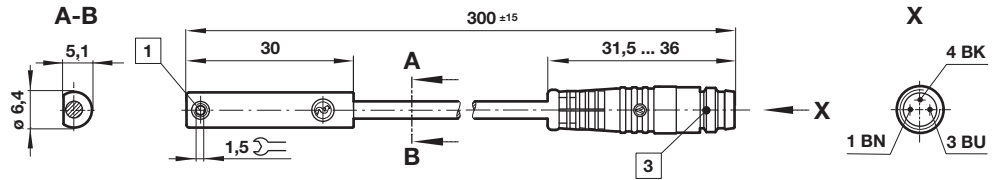
M/50/EAP/\*V,  
M/50/EAN/\*V  
M/50/IOP/5V  
Cable length L = 2, 5 or 10 m



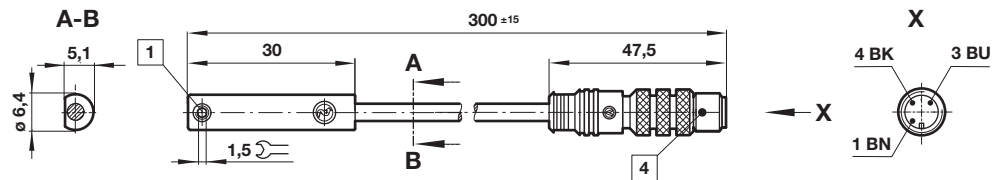
Dimensions in mm  
Projection/First angle



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



M/50/EAP/CC



- 1 Fixing screw
- 2 Color code: BK = black; BN = brown; BU = blue
- 3 Plug M8 x 1
- 4 Plug M12 x 1

**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*1)
PUR 3 x 0,25	5	0,18	M8 x 1	M/P73002/5*1)
PVC 3 x 0,25	5	0,18	M8 x 1	M/P34615/5*2)
PUR 3 x 0,25	5	0,18	M8 x 1	M/34596/5*2)
PUR 3 x 0,34	5	0,21	M12 x 1	M/P34594/5*1)





\*1) Straight connector

\*2) 90 ° Connector





### Bus card

Description	SI-PROFINET RT V2	SI-PROFIBUS	SI-EtherNet/IP	SI-EtherCAT	SI-CANopen	SI-DeviceNet
						
<b>Color code</b>	Green	Purple	Cream	Red	White	Grey
<b>Model</b>	QE/B18200/PN	QE/B17500/PB	QE/B17900/EN	QE/B18000/EC	QE/B17600/CO	QE/B17700/DN





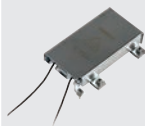
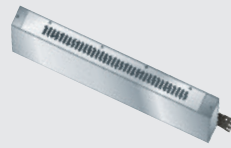
### Power cable

Description	Motor cable without brake		Motor cable with brake	
				
<b>Cable length</b>	5 m	10 m	5 m	10 m
<b>Model</b>	QE/C5402/08/5	QE/C5402/08/10	QE/C5402/18/5	QE/C5402/18/10

### Feedback cable

Description	Feedback cable resolver		Feedback cable Multi Turn	
				
<b>Cable length</b>	5 m	10 m	5 m	10 m
<b>Model</b>	QE/F5400/61/5	QE/F5400/61/10	QE/F5400/30/5	QE/F5400/30/10

### Drive accessories

<b>Multiple axis kit</b> short  QE/A9500/1047	<b>Multiple axis kit</b> long  QE/A9500/1048	<b>USB converter cable</b>  QE/A4500/0096	<b>KI compact display</b>  QE/A20400	<b>Brake resistor 50W</b>  QE/A9500/1049	<b>EMC filter for</b>  QE/D01400030 QE/D02400105 QE/A4200/8744 QE/A4200/1644
---	--	--	---	---	--

### Warning

These products are intended for use in industrial compressed air systems only. Do not use these products where pressures and temperatures can exceed those listed under »**Technical features/data**«. Before using these products with fluids other than those specified, for non-industrial applications, life-support systems or other applications not within published specifications, consult IMI Precision Engineering, Norgren GmbH.

Through misuse, age, or malfunction, components used in fluid power systems can fail in various modes. The system designer is warned to consider the failure modes of all component parts used in fluid power systems and to provide adequate safeguards to prevent personal injury or damage to equipment in the event of such failure.

System designers must provide a warning to end users in the system instructional manual if protection against a failure mode cannot be adequately provided.

System designers and end users are cautioned to review specific warnings found in instruction sheets packed and shipped with these products.