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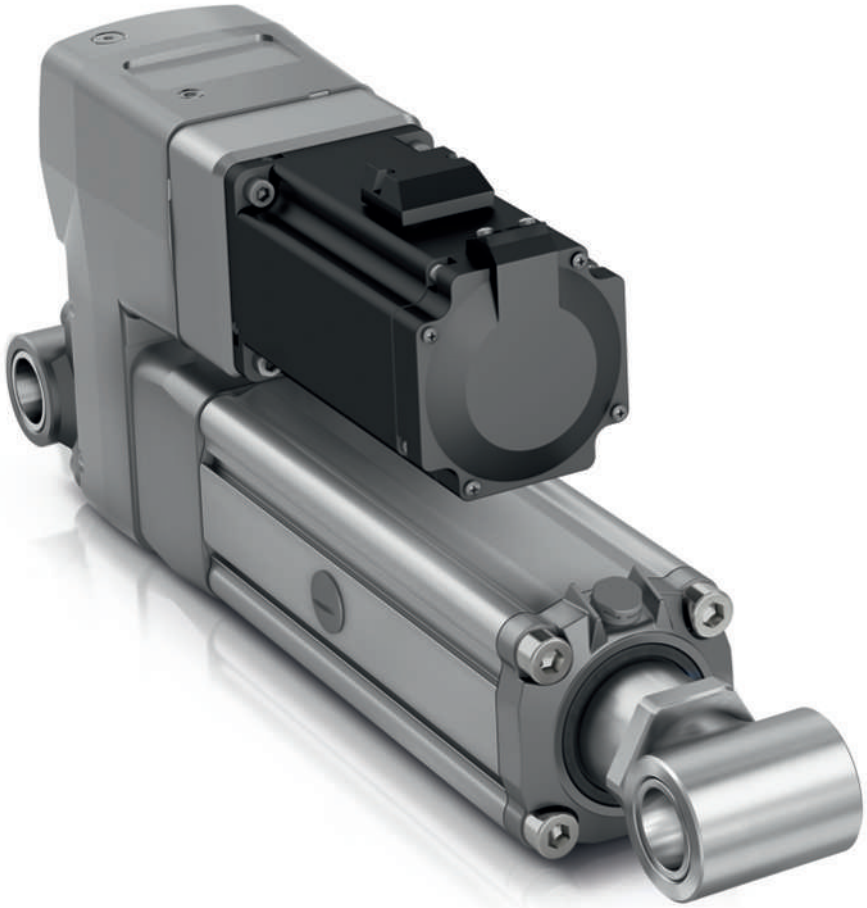

EWELLIX electric actuator EMA-80

High-Performance Actuator

Technical Product Information

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1 EWELLIX electric actuator EMA-80

The EWELLIX electric actuator EMA-80 is a modular electromechanical linear actuator developed specifically for use in mobile machinery. It replaces hydraulic and pneumatic applications in the automation and mechanical engineering industries, offering a compact, energy-efficient, and low-maintenance alternative for demanding motion tasks.

Features

Each component can be configured on a modular basis to provide an optimal solution with an excellent balance between performance and cost.

The following features ensure reliable and versatile use in industrial environments:

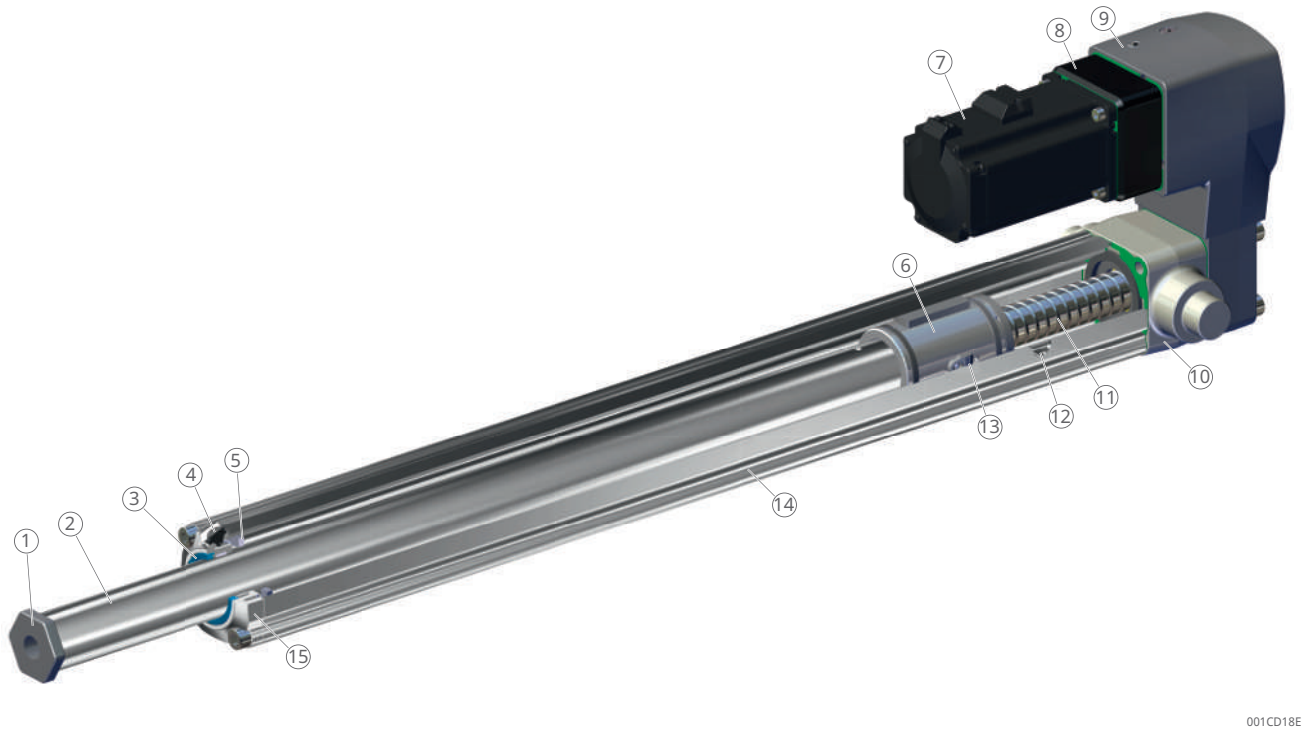
- Linear actuator
  - ball screw with or without backup nut for different requirements
  - precise positioning through high-accuracy screw drives
  - sealing system conforms to degree of protection IP65M
  - various primary and secondary attachment options
- Gearbox
  - linear or parallel orientation relative to the linear actuator
  - manual override on parallel gearbox to allow safe operation in the event of a power failure and for precise positioning during installation
- Motors
  - available in different sizes and performance classes
  - use of different motors due to customer-specific motor adapters

Benefits

- high efficiency and energy savings
- long lifetime even in the presence of high forces
- high flexibility due to different installation orientations, suitable for many applications
- compatible with a wide range of motors and control systems
- precise positioning and repeat accuracy

Product structure

1 Structure of the EWELLIX electric actuator



1	Connection piece	2	Push tube
3	Sealing	4	Vent plug
5	Rubber bumper	6	Nut with guiding rings and anti-rotation
7	Motor	8	Motor adapter
9	Gearbox	10	Bearing housing
11	Ball Screw	12	Relubrication port
13	Magnet for optional proximity sensors	14	Protection tube
15	Front cover		

The interfaces and assembly groups have the following functions:

- Front attachment:
  mechanical connection between the push tube and the movable part of the application via a thread
- Front cover:
  supports the push tube with an integrated plain bushing and front sealing package
- Bearing housing:
  contains the support bearing set of the screw drive comprising angular contact ball bearings
- Gearbox:
  connection module between the linear unit and the motor, available with various ratios
- Motor adapter:
  connecting module between the gearbox and the motor

Screw drive

The EWELLIX electric actuator EMA-80 is equipped with a ball screw.

The screw drive converts the rotary motion of the motor into precise and efficient linear motion, ensuring a high load carrying capacity and long lifetime.

Backup nut (optional)

During normal operation, the backup nut is not in contact with the ball screw. If the threaded nut fails, the backup nut prevents the linear actuator from abruptly retracting and enables the linear actuator to be pulled back safely. A high level of friction is generated at the backup nut during retraction.

Once the backup nut is engaged, the linear actuator must be replaced.

The function of the backup nut is limited to push loads (push direction).

1.1 Performance overview

The characteristics of the EWELLIX electric actuator are determined by the overall configuration, such as axial force and linear speed. The following components have a significant impact on these characteristics:

- screw drive
- gearbox
- motor

1 Performance overview, linear unit

Characteristic	EMA-80
Performance data	
F_{max}	32
F_{L10} [1)]	32
F_{0max}	45
C_a	31
M_F	58
v_{max}	160
n_{max}	960
a_{max}	6
ED_L	100
P_{cont}	1.8
Mechanical data	
d_S	32
P	10
P_a	G7
H_{max}	1500
H_{min}	50
H_r	3
s_b	<0.1
η	>85
J_{H0}	88.56
J_{H100}	64.76
m_{H0}	5
m_{H100}	3.16
Ambient data	
ϑ_{amax}	49
ϑ_{amin}	–18
Φ	95
IP	IP65M

1) max. dynamic axial force that can be used for the theoretical lifetime calculation (L10)

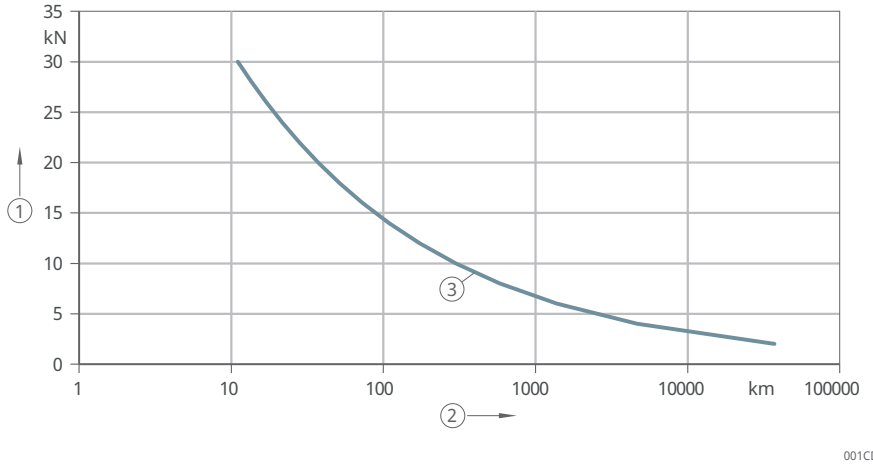
a_{max}	m/s^2	Maximum acceleration
C_a	kN	Dynamic axial load rating
d_S	mm	Diameter of screw shaft
ED_L	%	Duty cycle of the electric actuator
P_{cont}	kW	max. average continuous power at 100 % ED_L
F_{0max}	kN	Max. static axial force
F_{L10}	kN	Max. dynamic axial force L10
F_{max}	kN	Max. dynamic axial force
H_{max}	mm	Max. stroke
H_{min}	mm	min. stroke
H_r	mm	stroke reserve per side
IP	–	Protection class
J_{H0}	$kg \cdot m^2$	inertia at 0 mm stroke
J_{H100}	$kg \cdot m^2$	inertia at 100 mm stroke
M_F	Nm	Torque, to achieve F_{max}

m_{H0}	kg	mass at 0 mm stroke
m_{H100}	kg	mass at 100 mm stroke
n_{max}	min^{-1}	Max. speed
P	mm	Lead
P_a	–	Pitch accuracy
s_b	mm	reverse clearance
v_{max}	mm/s	Max. linear speed
ϑ_{amax}	°C	Max. ambient temperature
ϑ_{amin}	°C	Min. ambient temperature
Φ	%	Max. humidity
η	%	Efficiency

1.2 Lifetime

Linear actuators are designed for a high number of operating cycles under heavy loads.

2 EMA-80 lifetime

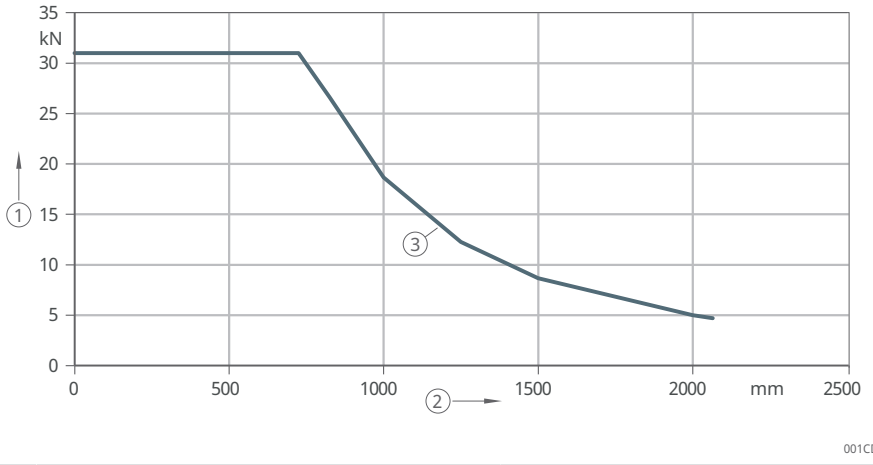


1	Equivalent dynamic axial load F_M	2	Lifetime l
3	EMA-80		

1.3 Buckling load

The buckling load specifies the load limit at which the EWELLIX electric actuator bends or deforms laterally in the event of a purely axial load. Transverse forces reduce this value.

3 EMA-80 buckling load



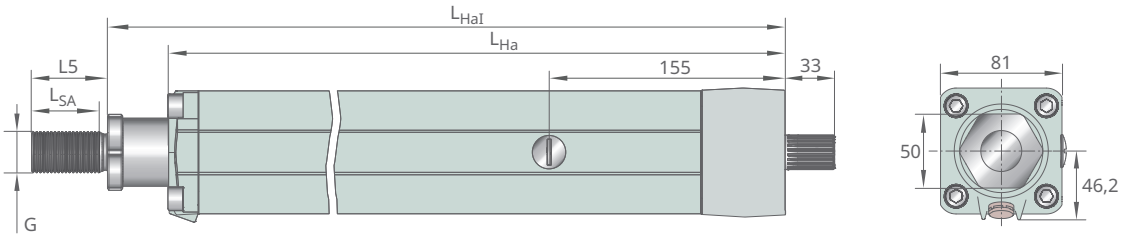
1	Buckling load F_{ki}	2	Stroke H
3	EMA-80		

1.4 Geometrical dimensions

Dimensions

with male thread on push tube

4 Dimensions with male thread on the push tube



2 Dimensions with male thread on the push tube

Characteristic	EMA-80-1C-...-1	EMA-80-1D-...-1
Backup nut [1]	–	✓
G	M27×2	M27×2
L_{Ha}	H_0 + 187	H_0 + 195
L_{HaI}	H_0 + 239	H_0 + 247
Spline, shaft end	DIN5480 W23×1×22×8f	DIN5480 W23×1×22×8f
L_{SA}	37.5	37.5
L5	50	50

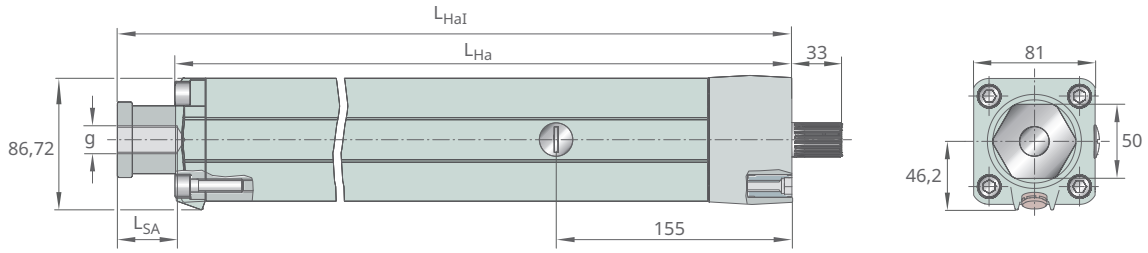
[1] In push direction only

G	–	thread, connection piece
H_0	mm	nominal stroke
L5	mm	usable thread length
L_{SA}	mm	Thread length
L_{Ha}	mm	length of front cover to bearing housing
L_{HaI}	mm	length of lock nut screw-in piece to bearing housing

Dimensions

with female thread on push tube

5 Dimensions with female thread on push tube



3 Dimensions with female thread on push tube

Characteristic	EMA-80-1C-...-3	EMA-80-1D-...-3
Backup nut [2]	–	✓
g	M20×1.5	M20×1.5
L_{Ha}	H_0 + 187	H_0 + 195
L_{HaI}	H_0 + 239	H_0 + 247
Spline, shaft end	DIN5480 W23×1×22×8f	DIN5480 W23×1×22×8f
L_{SA}	37.5	37.5
L5	44.5	44.5

[2] In push direction only

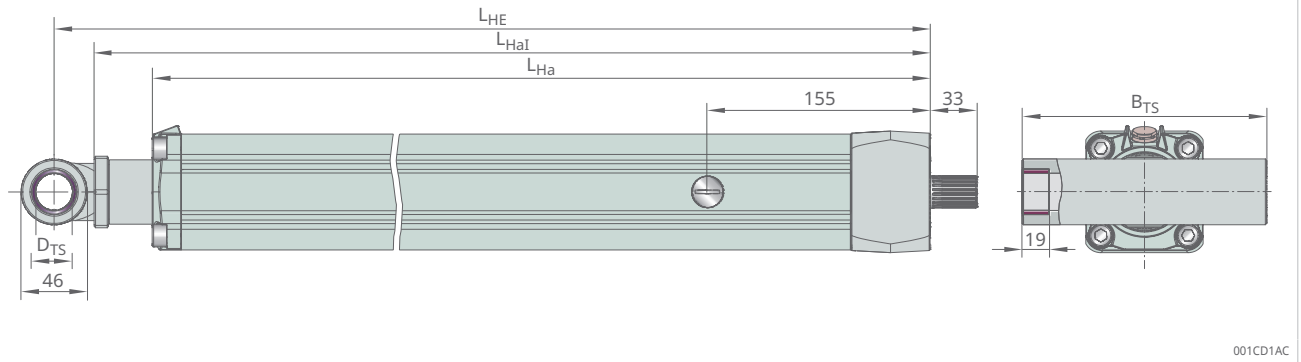
g	–	thread, connection piece
H_0	mm	nominal stroke
L5	mm	usable thread length
L_{SA}	mm	Thread length
L_{Ha}	mm	length of front cover to bearing housing
L_{HaI}	mm	length of lock nut screw-in piece to bearing housing

1

Dimensions

With T-bar on push tube

6 Dimensions with T-bar on push tube



4 Dimensions with T-bar on push tube

Characteristic	EMA-80-1C-...-T	EMA-80-1C-...-U	EMA-80-1D-...-T	EMA-80-1D-...-U
Backup nut [3]	–	–	✓	✓
L_{Ha}	H_0 + 187	H_0 + 187	H_0 + 195	H_0 + 195
L_{HaI}	H_0 + 239	H_0 + 239	H_0 + 247	H_0 + 247
L_{HE}	H_0 + 259	H_0 + 259	H_0 + 267	H_0 + 267
D_{TT}	25.68...25.78	25.68...25.78	25.68...25.78	25.68...25.78
B_{TT}	100	131	100	131
Spline, shaft end	DIN5480 W23×1×22×8f	DIN5480 W23×1×22×8f	DIN5480 W23×1×22×8f	DIN5480 W23×1×22×8f

[3] In push direction only

B_{TT}	mm	T-bar width
D_B	"	recommended pin diameter
D_{TT}	mm	inner diameter of bushing in T-bar
H_0	mm	nominal stroke
L_{Ha}	mm	length of front cover to bearing housing
L_{HaI}	mm	length of lock nut screw-in piece to bearing housing
L_{HE}	mm	length of center eye T-bar to bearing housing

1.5 Sealing

The EWELLIX EMA-80 electric cylinder is sealed in accordance with IP65M. To meet the specified IP degrees of protection, the bearing housing must be sealed by a recommended gearbox or by a gearbox with identical sealing properties.

The IP65M seal protects against the ingress of dust and water jets during movement.

Higher IP degrees of protection are available on request.

1.6 Lubrication

The screw drive must be relubricated via the relubrication facility according to the specified maintenance interval. Schaeffler recommends a fully synthetic long-life grease suitable for high temperature and push loads. Lubrication with food-grade grease is available on request. The bearing of the screw drive spindle is maintenance-free.

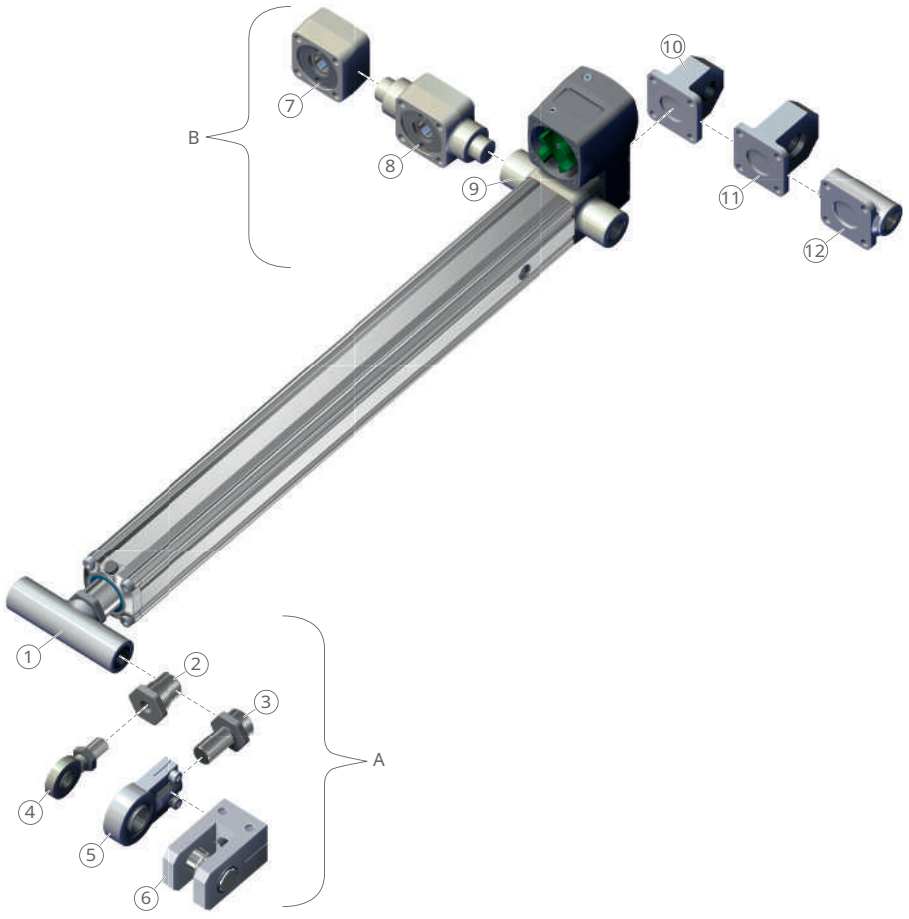
1.7 Attachments

The EWELLIX electric actuator EMA-80 has three interfaces for different attachment options:

- on the push tube ➤14|1.7.1
- on the bearing housing ➤18|1.7.2
- on the parallel gearbox ➤20|1.7.3

The EWELLIX electric actuator requires a primary attachment and a secondary attachment. Use of the primary attachment (A) on the push tube is standard. In addition, a secondary attachment (B) must be selected on the bearing housing or on the parallel gearbox.

7 Attachment options for the linear actuator



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Primary attachments (A):			
1	T-bar	2	Connection piece with female thread
3	Connection piece with male thread	4	Rod end for female thread
5	Rod end for male thread	6	Rod clevis for male thread
Secondary attachments (B):			
7	Bearing housing without attachment option	8	Bearing housing with male trunnion mount
9	Bearing housing with female trunnion mount	10	Plain bearing with bushing on the parallel gearbox
11	Spherical attachment on the parallel gearbox	12	T-bar on the parallel gearbox

1.7.1 Attachments on the push tube (primary attachment)

The push tube of the EWELLIX EMA-80 electric actuator is suitable for various applications and available in the following versions:

- with female thread M20
  - without attachment
  - with rod end
- with male thread M27
  - without attachment
  - with rod end
  - with rod clevis
- with T-bar 131 mm or 100 mm

1.7.1.1 Rod end

The rod ends can be assembled on a connection piece with female thread M20 or a connection piece with male thread M27.

The rod ends are available in two versions:

- rod end for connection piece with female thread M20, order code: EMA-80-1...-G
- rod end for connection piece with male thread M27, order code: EMA-80-1...-A

8 Rod end for connection piece with female thread M20

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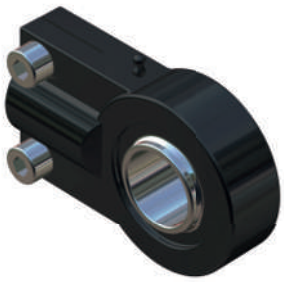
9 Rod end for connection piece with male thread M27



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Performance data

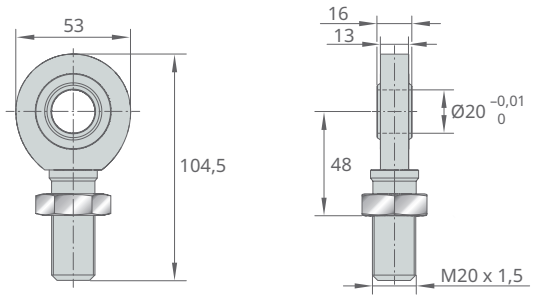
5 Performance data for rod ends

Thread	C_a	C_{0a}
Rod end for connection piece M20	67.9	75.6
Rod end for connection piece M27	87.5	98.8

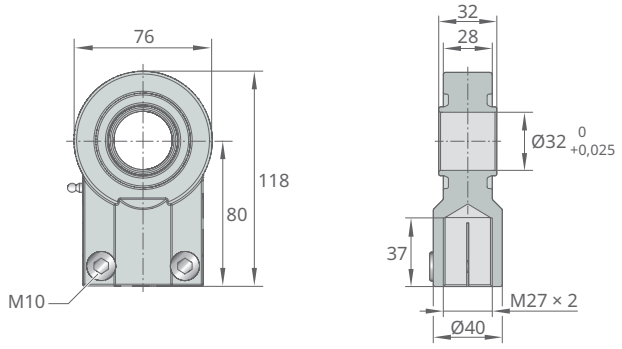
C_{0a}	kN	Static axial load rating
C_a	kN	Dynamic axial load rating

Dimensions

10 Rod end dimensions M20



11 Rod end dimensions M27

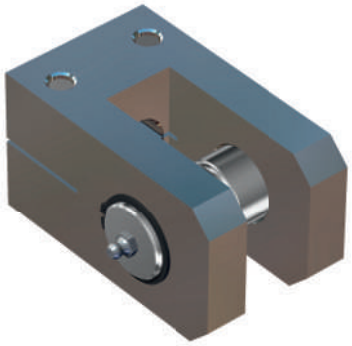


1.7.1.2 Rod clevis

The rod clevis can be assembled on a male thread M27 and corresponds to DIN 8132.

Order code: EMA-80-1...-B

12 Rod clevis M27



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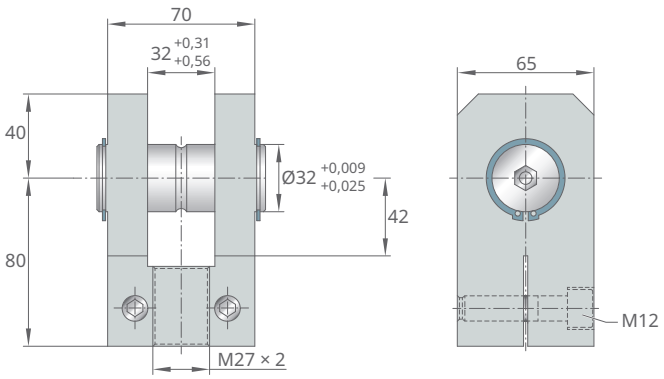
Performance data

6 Rod clevis performance data

Characteristic	Unit	EMA-80-1...-B
max. Force absorption	kN	50

Dimensions

13 Dimensions rod clevis M27



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1.7.1.3 T-bar

The push tube attachment is available as a rotatable T-bar with integrated anti-rotation lock.

Order code: EMA-80-1...-T/U

14 T-bar

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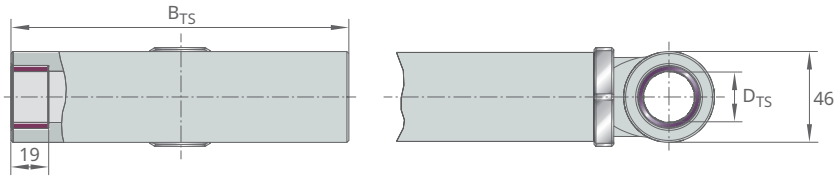
Dimensions

15 T-bar dimensions



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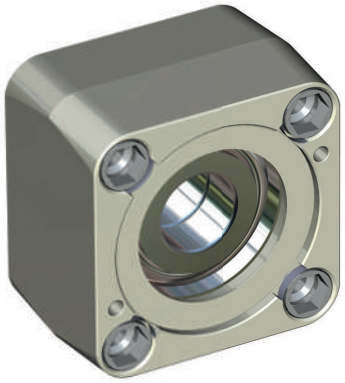
7 T-bar dimensions

Characteristic	EMA-80-1...-T	EMA-80-1...-U
D_{TT}	25.68...25.78	25.68...25.78
B_{TT}	100	131
D_B	$1.000^{+0}/_{-0.002}$	$1.000^{+0}/_{-0.002}$

B_{TT}	mm	T-bar width
D_{TT}	mm	inner diameter of bushing in T-bar
D_B	"	recommended pin diameter

1.7.2 Attachments on the bearing housing (secondary attachment)

16 Bearing housing without attachment option



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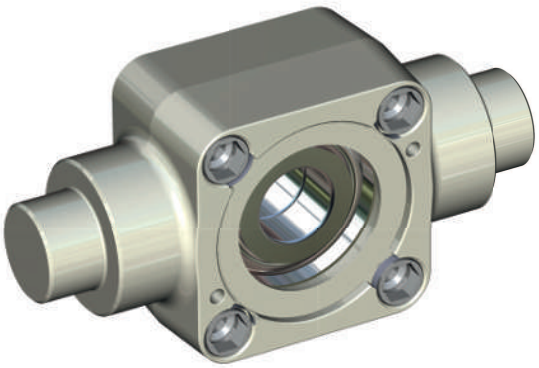
17 Bearing housing with male trunnion mount



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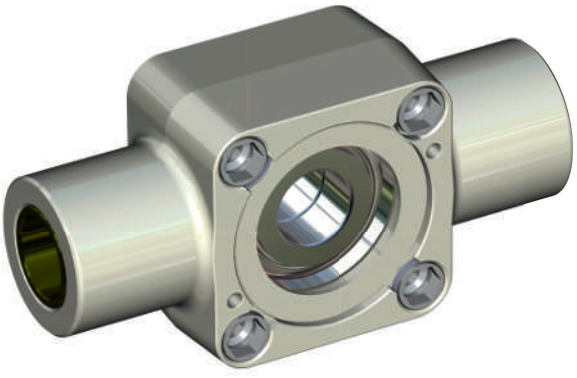
18 Bearing housing with female trunnion mount



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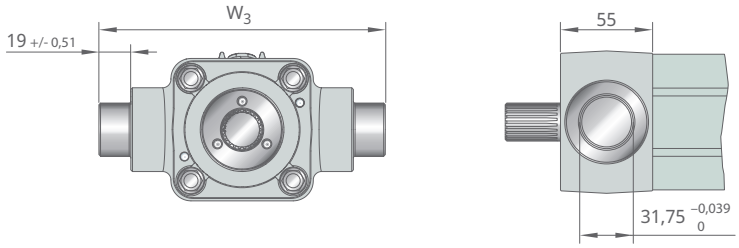
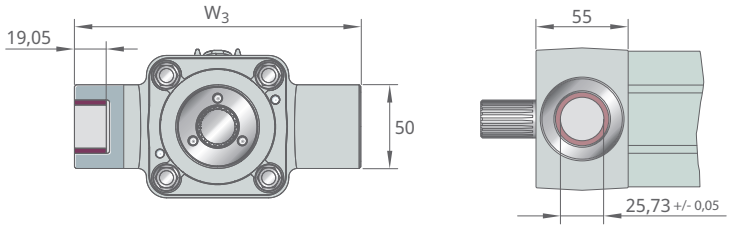
Dimensions

19 Dimensions of bearing housing without attachment

20 Dimensions of bearing housing with male trunnion mount



21 Dimensions of bearing housing with female trunnion mount



Dimension W3 is 131 mm (standard). Deviating dimensions up 171 mm mm are available on request.

1.7.3 Attachments on the parallel gearbox (secondary attachment)

The EWELLIX electric actuator EMA-80 can be mounted on the parallel gearbox in various ways within the design:

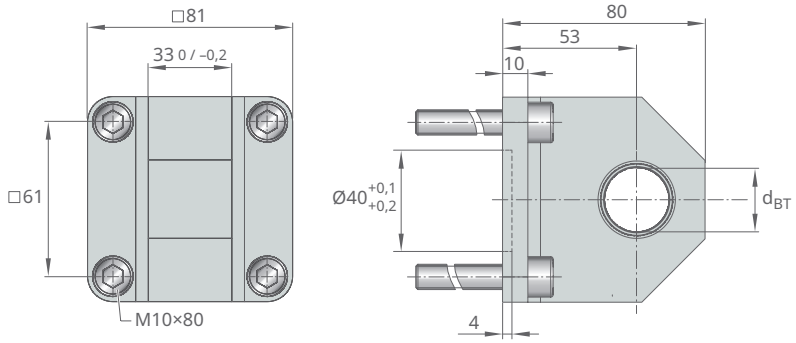
- plain bearing with bushing
- spherical attachment
- T-bar

1.7.3.1 Plain bearing with bushing

To align the attachment on the parallel gearbox, the gearbox itself is used as the reference ➤39|5.1.

Dimensions

22 Dimensions, plain bearing with bushing



8 Dimensions, plain bearing with bushing

Characteristic	EMA-80-...-...B0 EMA-80-...-...B1	EMA-80-...-...B2 EMA-80-...-...B3
AF	Plain bearing 25 mm	Plain bearing 1"
A_B	25 f7	1.000" 0.9980"
d_{BT}	25 +0.085 25 –0.01	25.37 ± +0.085 25.37 ± –0.01

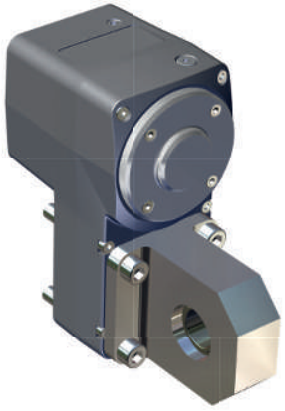
AF	–	Design
A_B	"	recommended pin dimension
d_{BT}	mm	inner diameter of bushing in T-bar

Schaeffler recommends a shaft tolerance of f7 for mounting on the parallel gearbox with plain bearing.

1.7.3.2 Spherical attachment

To align the attachment on the parallel gearbox, the gearbox itself is used as the reference.

23 Spherical attachment



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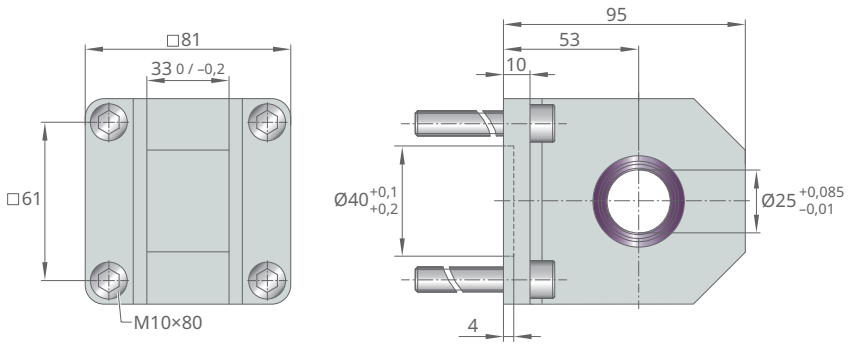
24 Dimensions for spherical attachment



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Schaeffler recommends a shaft tolerance of f7 for mounting on the parallel gearbox with spherical attachment.

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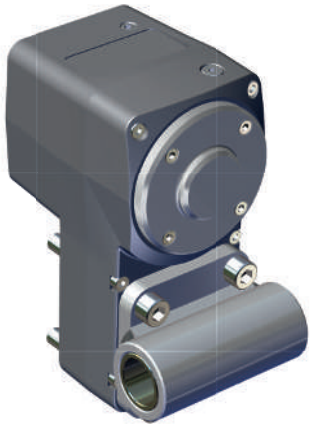
1.7.3.3 T-bar

To align the attachment on the parallel gearbox, the gearbox itself is used as the reference.

25 Attachment with T-bar



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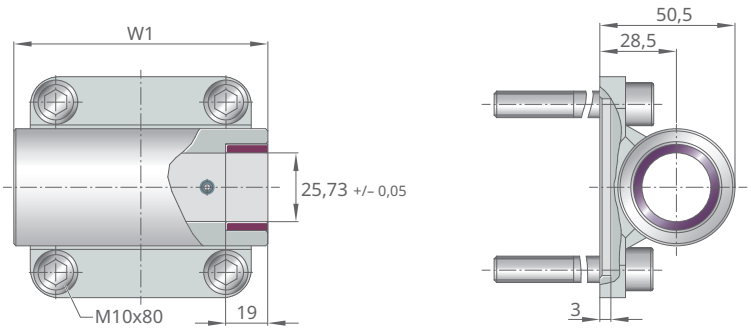
Dimensions

26 Dimensions for attachment with T-bar



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9 Dimensions for attachment on parallel gearbox with T-bar

Characteristic	EMA-80-...-...T0
W1	100

W1 mm width of attachment on parallel gearbox with T-bar

2 Gearbox

Gearboxes connect the linear actuator to the motor adapter, providing a force-locking connection. Various gearbox variants are available for the EWELLIX electric actuator EMA-80, which can be installed either in linear or parallel arrangements relative to the linear actuator. The two gearbox types differ in terms of shape, power transmission and gear ratio. The different gearbox options allow for adaptation to demanding installation situations and technical requirements.

Inline gearboxes reduce the cross-sectional installation space, while parallel gearboxes shorten the overall length of the retracted system. The choice of gear ratio influences both the design of the drive unit and the motor selection, particularly with regard to efficiency and cost.

For parallel gearboxes, various secondary attachment options are available ➤20|1.7.3.

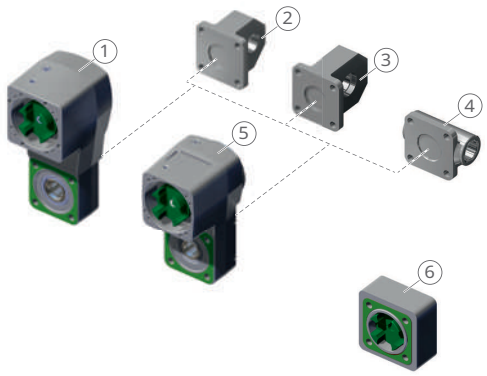
Inline and parallel gearboxes are equipped with grease-based lifetime lubrication.

When ordering parallel gearboxes, observe the orientation relative to the linear unit ➤41|5.1.1.

2.1 Overview

Compatible gearboxes are available in linear (inline) and parallel arrangements to the linear actuator. Parallel gearboxes are available with various options ➤20|1.7.3.

27 Gearbox variants and options



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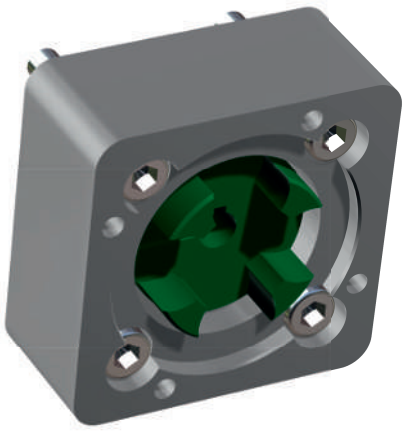
Parallel gearboxes:			
1	3-stage parallel gearbox	2	Attachment on the parallel gearbox with plain bearing with bushing
3	Spherical attachment on the parallel gearbox	4	Attachment on the parallel gearbox with T-bar
5	2-stage parallel gearbox		
Inline gearboxes:			
6	Inline gearbox		

2.2 Inline gearboxes

28 Inline gearboxes



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The inline gearbox transfers the motor torque directly from the motor shaft to the input shaft of the linear unit, with a gear ratio of 1:1.

For installation, the gearbox is pushed on the shaft of the linear actuator and secured with a screw connection. The coupling counterpart is integrated into the motor adapter. The inline adapter is compatible with all motor adapter flanges.

The inline gearbox is maintenance-free.

2.2.1 Performance data

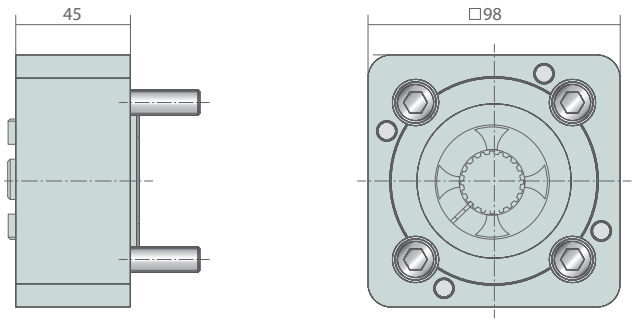
10 Performance data for inline gearboxes

Characteristic	EMA-80-...-DA...
i_G	1
M_{0o}	60
$M_o$max	90
$v_i$max	960
η	100
m	0.5

i_G	–	gearbox ratio
m	kg	Mass
M_{0o}	Nm	nominal output torque
$M_o$max	Nm	max. output torque
$v_i$max	min^{-1}	max. input speed
η	%	Efficiency

2.2.2 Dimensions

29 Dimensions for inline gearboxes



2.3 Parallel gearboxes

The parallel gearbox permits an especially short installation length. The available gear ratios reduce the motor torque required to generate the desired force. However, this advantage comes with a limited output speed.

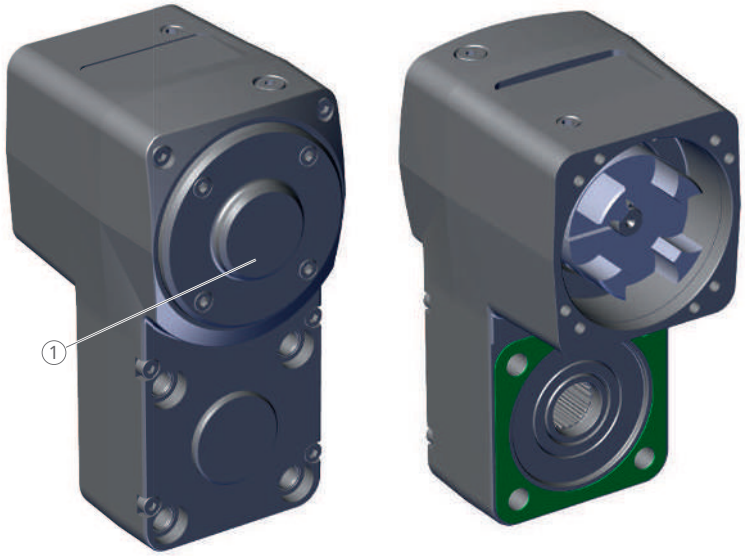
The more compact 2-stage gearbox is available with a fixed ratio and allows use in limited installation space. For the 3-stage gearbox, three different gear ratios are available, offering a max. output torque of 100. Nm

The coupling is already mounted on the output shaft and secured with a screw. The coupling counterpart is located on the motor adapter.

Parallel gearboxes are equipped with an integrated manual override. This feature enables flexible positioning of the EWELLIX electric actuator EMA-80 even in hard-to-access orientations and independently of the power supply. Operation is performed manually using a hex key, facilitating assembly, maintenance, and safe operation in the event of a power failure. The hex socket is located on the gearbox motor shaft. The access point to the hex socket is covered by a cap as standard. The gearbox is sealed according to IP65M.

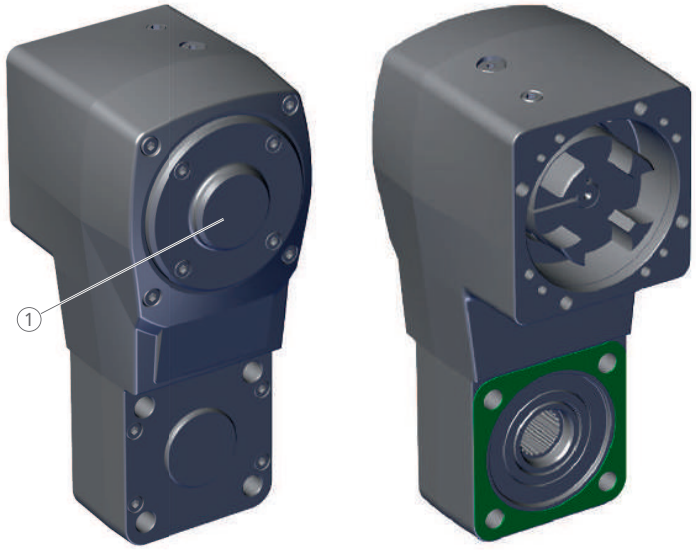
The parallel gearbox is lubricated with grease and maintenance-free.

30 2-stage parallel gearbox



1	Access to manual override

31 3-stage parallel gearbox



1	Access to manual override

2.3.1 Performance data

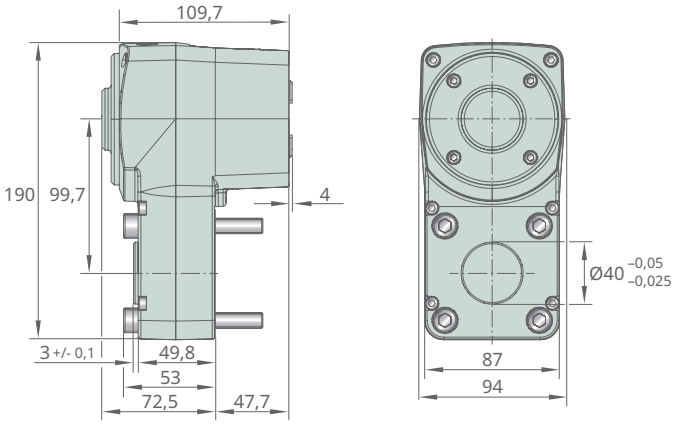
11 Performance data for parallel gearboxes

Characteristic	EMA-80-...-SB	EMA-80-...-SC	EMA-80-...-SD	EMA-80-...-SF
Gearbox	3	3	3	2
Lubrication	Grease	Grease	Grease	Grease
i_G	4.005:1	12.144:1	19.966:1	9.95:1
M_{0o}	60	60	60	60
$M_o$max	70	100	100	100
$v_i$max	4000	4000	4000	4000
v_{0i}	2550	2550	2550	2550
η	85	85	85	90
F_{aB}max	32	32	32	32
m	3.9	3.9	3.9	2.1

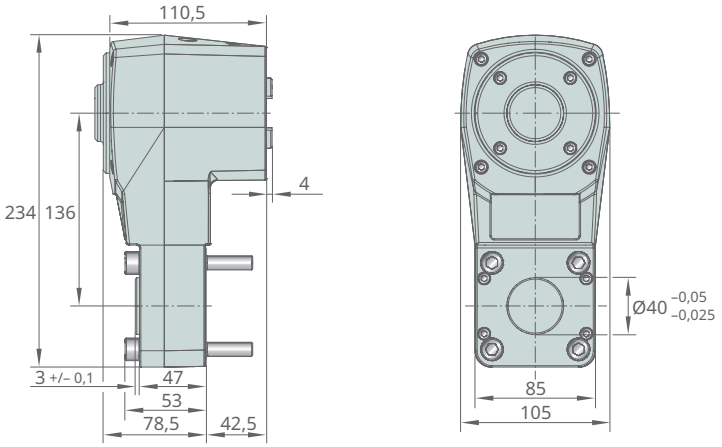
ED($M_{0o}v_{0i}$)	%	duty cycle at $M_{0o}v_{0i}$
F_{aB}max	kN	max. axial load with rear attachment (continuous load, alternating)
i_G	–	gearbox ratio
m	kg	Mass
M_{0o}	Nm	nominal output torque
$M_o$max	Nm	max. output torque
v_{0i}	min^{-1}	rated input speed
$v_i$max	min^{-1}	max. input speed
η	%	Efficiency

2.3.2 Dimensions

32 Dimensions for 2-stage parallel gearbox



33 Dimensions for 3-stage parallel gearbox



3 Motor adapter

The motor adapter allows different motors to be used with the EWELLIX electric actuator EMA-80. The standardized mechanical interface allows the motor adapter to be connected to any EMA gearbox via plug-and-play. The mechanical connection is critical for transmitting motion and torque from the motor to the linear actuator.

34 Motor adapter

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Precise alignment between motor and gearbox is essential to minimize vibration and wear. The motor adapter ensures proper alignment to deliver optimal performance and efficiency.

Motor adapters can facilitate maintenance and replacement of motors. They allow quick and easy access to the motor without the need to dismantle the entire linear drive.

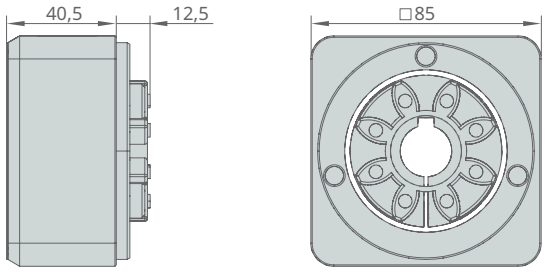
The following parts are included in the scope of delivery:

- seals
- screws
- 1x coupling half

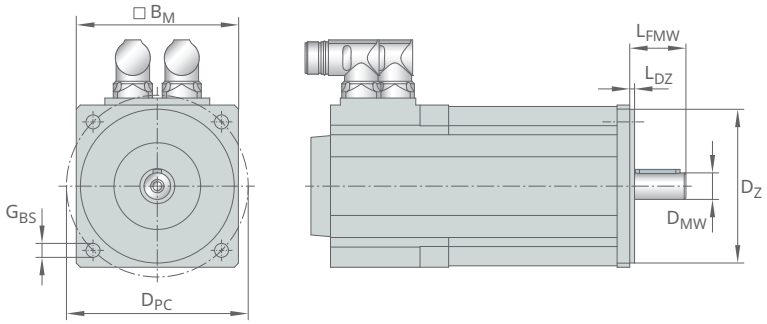
For easier handling, each motor adapter is equipped with a blind hole in M12. In combination with an eye bolt, this allows attachment to lifting and other third-party equipment.

To connect a motor to a gearbox, Schaeffler offers motor adapter flanges for the most common motor types. If the motor does not meet the following specifications, please contact Schaeffler.

35 Motor adapter dimensions



36 Motor adapter dimensions for inline gearbox and 3-stage spur gearbox



12 Motor dimensions for inline gearbox and 3-stage spur gearbox

Motor adapter	Dz	L_{Dz}	D_{MW}	L_{FMW}	D_{PC}	G_{BS}	B_M min.
AA1	80	<7	19	40	100	M6	≥86
AA2	110	<7	24	50	130	M8	≥116
AA3	130	<7	32	58	165	M10	≥136
AA4	180	<7	38	80	215	M12	≥186
CC1	80	<7	16	40	100	M6	≥86
CC2	110	<7	19	40	130	M8	≥116
CC3	130	<7	24	50	165	M10	≥136
CC4	70	<7	19	40	90	M5	≥76
CC5	110	<7	22	55	145	M8	≥116

B_M	mm	motor width
D_{MW}	mm	Motor shaft diameter
D_{PC}	mm	hole circle diameter
Dz	mm	centering diameter
G_{BS}	–	attachment screw thread
L_{Dz}	mm	length of centering diameter
L_{FMW}	mm	length of motor flange to end of motor shaft

Inline gearboxes are compatible only with flange-mounted motors and motor adapters with through holes. The motor adapter cannot be attached using a threaded connection.

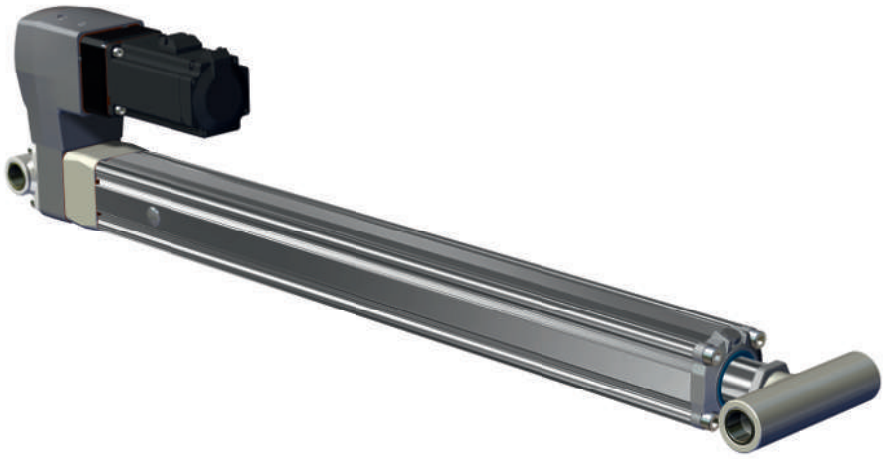
4 Motor

The electric motor is the primary drive element of the linear actuator and converts electrical energy into rotary motion. For the EWELLIX electric actuator EMA-80, a servo motor is available in three configuration variants. Alternatively, customer-specific motors can be adapted via the standardized motor interface ➤29|3.

Motors are available in various performance classes ➤32|4.1.

The position relative to the gearbox must be observed when ordering motors ➤41|5.1.2.

37 EWELLIX-Electric actuator with motor, 2 Nm EM holding brake



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38 EWELLIX-Electric actuator with motor, 10 Nm EM holding brake and manual release

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4.1 Performance data

4.1.1 Overall performance of linear actuator with 750 W servo motor

This motor is available with 3 different brake configuration options.

Motor performance is the same across all 3 options. The exact performance values can be found in the manufacturer's data sheets.

13 Performance data

Characteristic	EMA-80-...-F11	EMA-80-...-F13	EMA-80-...-F14
PV_0	750	750	750
v_0	3000	3000	3000
M_0	2.4	2.4	2.4
v_{max}	4300 ±10 %	4300 ±10 %	4300 ±10 %
M_{max}	7.1	7.1	7.1
Motor technology	PMAC	PMAC	PMAC
U_M	24	24	24

M_0	Nm	rated torque
M_{max}	Nm	Max. torque
PV_0	W	rated power
U_M	DCV	motor voltage
v_0	min^{-1}	rated speed
v_{max}	mm/s	Max. linear speed

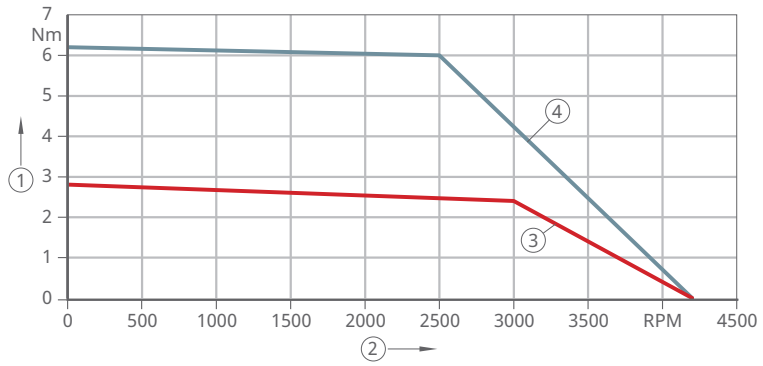
14 Brake configuration options

Characteristic	EMA-80-...-F11	EMA-80-...-F13	EMA-80-...-F14
Brake type	Electromagnetic	Electromagnetic	Electromagnetic
Manual release	–	–	✓
M_{sB}	2	10	10
U_B	24	24	24
PV_B	9	20	20

M_{sB}	Nm	static holding torque
PV_B	W	brake power
U_B	DCV	brake voltage

Motor speed and motor torque

39 Motor speed and motor torque 750 W servo motor



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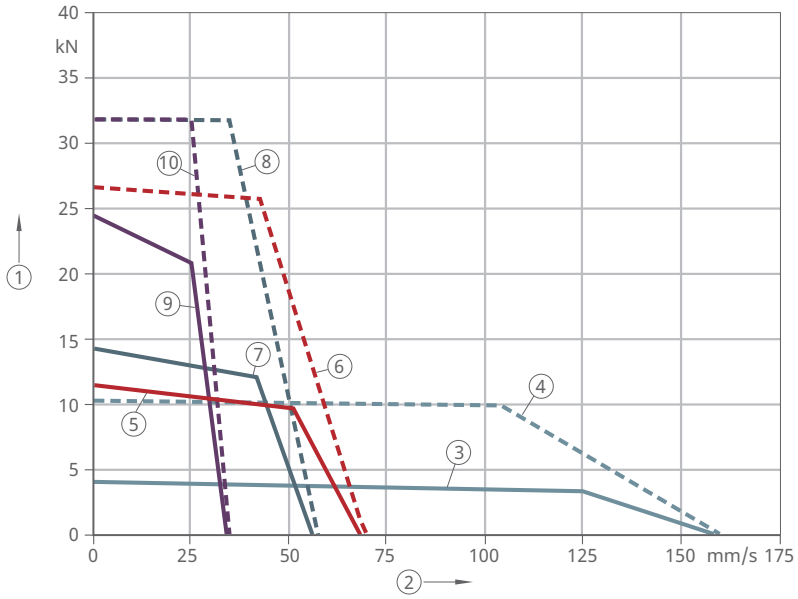
1	Torque	2	Rotational speed
3	Continuous torque	4	Peak torque

Speed-load diagram

40 Speed-load diagram for 750 W servo motor



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1	Load	2	Speed
3	Continuous load i4	4	Peak load i4
5	Continuous load i9.8	6	Peak load i9.8
7	Continuous load i12	8	Peak load i12
9	Continuous load i20	10	Peak load i20

4.1.2 Overall performance of linear actuator with example motor (1 kW)

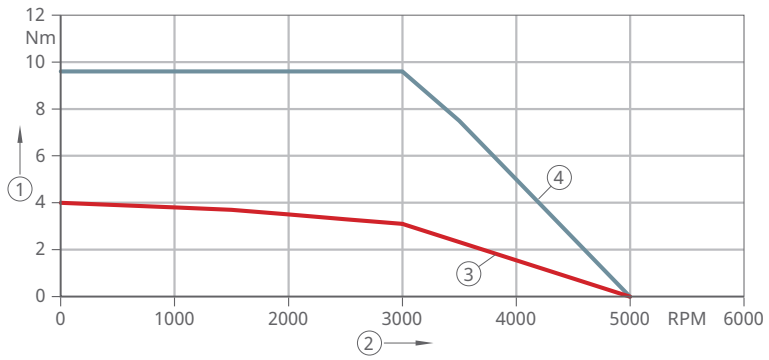
15 Performance data

Characteristic	Value
PV_0	1
v_0	3000
M_0	3
v_{max}	5000
M_{max}	9.6

M_0	Nm	rated torque
M_{max}	Nm	Max. torque
PV_0	W	rated power
v_0	min^{-1}	rated speed
v_{max}	mm/s	Max. linear speed

Motor speed and motor torque

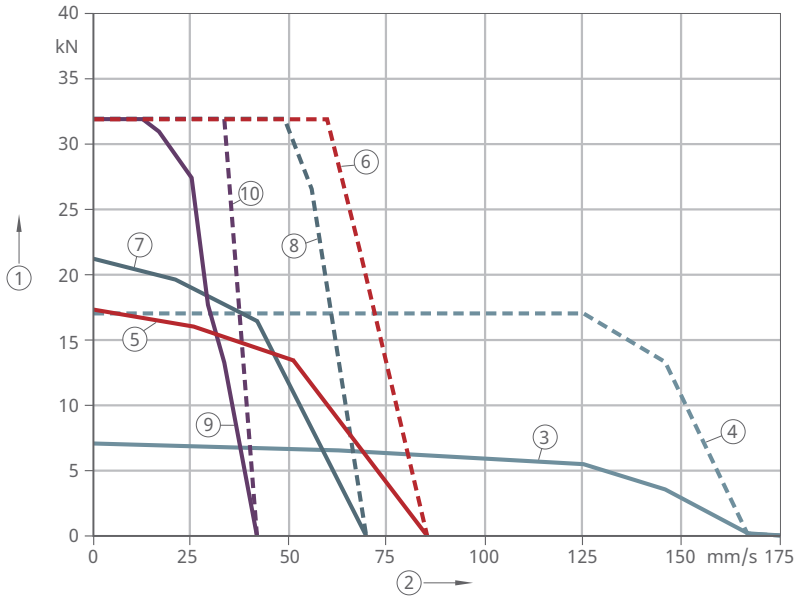
41 Motor speed and motor torque for 1 kW motor



1	Torque	2	Rotational speed
3	Continuous torque	4	Peak torque

Speed-load diagram

42 Speed-load diagram for 1 kW motor



1	Load	2	Speed
3	Continuous load i4	4	Peak load i4
5	Continuous load i9.8	6	Peak load i9.8
7	Continuous load i12	8	Peak load i12
9	Continuous load i20	10	Peak load i20

4.1.3 Overall performance of linear actuator with example motor (1.5 kW)

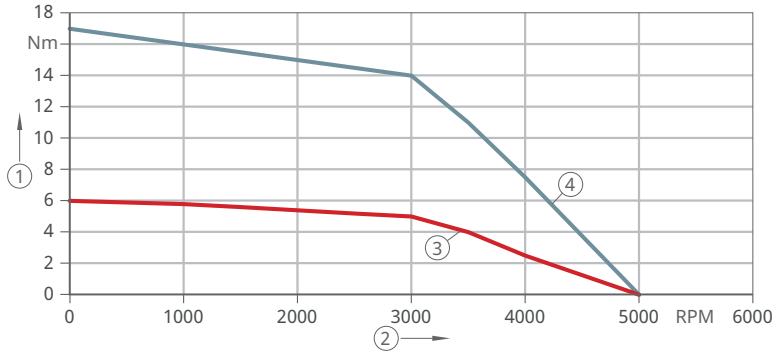
16 Performance data

Characteristic	Value
PV_0	1.5
v_0	3000
M_0	5
v_{max}	5000
M_{max}	17

M_0	Nm	rated torque
M_{max}	Nm	Max. torque
PV_0	W	rated power
v_0	min^{-1}	rated speed
v_{max}	mm/s	Max. linear speed

Motor speed and motor torque

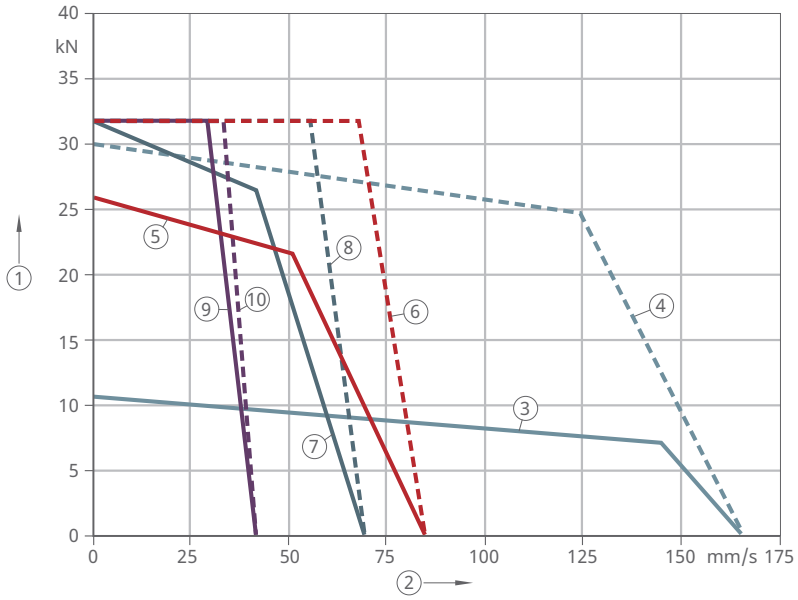
43 Motor speed and motor torque for 1.5 kW motor



1	Torque	2	Rotational speed
3	Continuous torque	4	Peak torque

Speed-load diagram

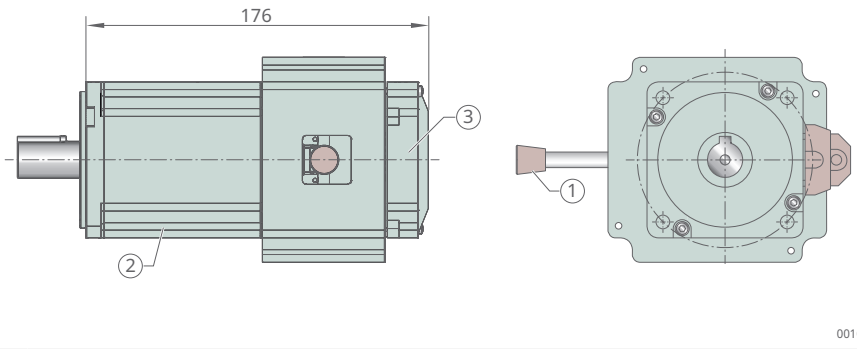
44 Speed-load diagram for 1.5 kW motor



1	Load	2	Speed
3	Continuous load i4	4	Peak load i4
5	Continuous load i9.8	6	Peak load i9.8
7	Continuous load i12	8	Peak load i12
9	Continuous load i20	10	Peak load i20

4.2 Dimensions

45 Dimensions for 750-W servo motor Fulling FL80SV75



1	Manual release of the brake	2	Motor housing/motor
3	Brake housing		

46 Dimensions for 750-W servo motor Fulling FL80SV75

17 Dimensions with 750 W servo motor Fulling FL80SV75

Character-istic	EMA-80-...-F11	EMA-80-...-F13	EMA-80-...-F14
L_1	187	217	217
L_2	40.5	40.5	40.5
L_3	123.5	91	91
L_4	–	63	63
L_5	22	22	22
H_1	–	105	105
B_1	–	–	107
B_2	54	65	65
B_3	80	80	80
B_4	–	112	112

B_1	mm	manual release width
B_2	mm	connector width
B_3	mm	housing width
B_4	mm	brake housing width
H_1	mm	brake housing height
L_1	mm	motor length incl. adapter
L_2	mm	adapter length
L_3	mm	motor housing length
L_4	mm	brake housing length
L_5	mm	encoder length

5 Structure of the ordering key

The linear actuator EMA-80 can be ordered in the following versions:

- gearbox unit without motor and motor adapter
- gearbox unit with motor adapter
- gearbox unit with motor and motor adapter

5.1 Notes on orientation

Various installation orientations are available for the EWELLIX electric actuator EMA-80, both for the entire linear unit and for individual components:

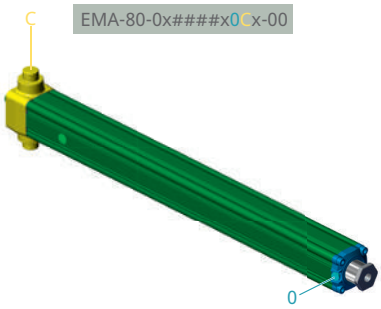
- entire linear unit relative to the gearbox (with male trunnion mount and vent plug)
- motor relative to gearbox
- attachment on the parallel gearbox relative to relubrication port
- attachment on the bearing housing relative to linear unit
- front cover with vent plug relative to the linear unit

5

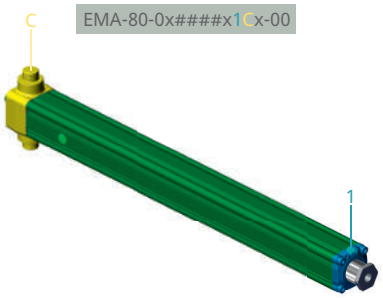
47 Matrix orientations

EMA-80-0x####x0Bx-00

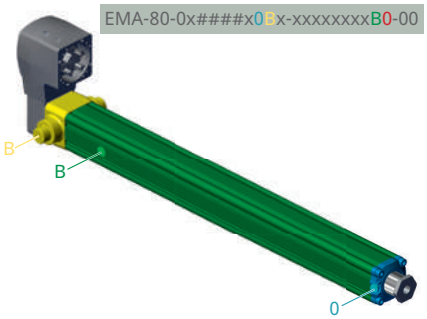
EMA-80-0x####x0Cx-00



EMA-80-0x####x1Cx-00



EMA-80-0x####x0Bx-xxxxxxxxB0-00



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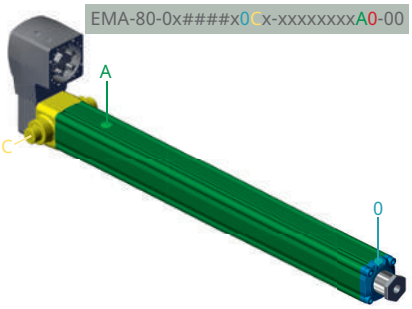
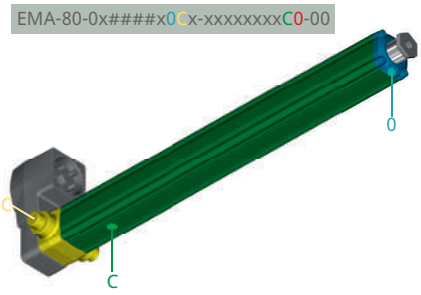
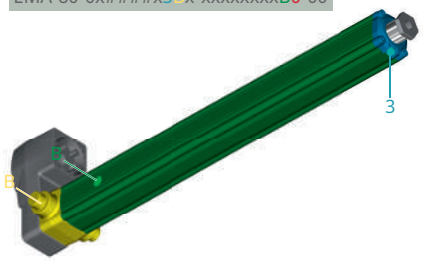


EMA-80-0x####x0Cx-xxxxxxxxC0-00



EMA-80-0x####x3Bx-xxxxxxxxB0-00



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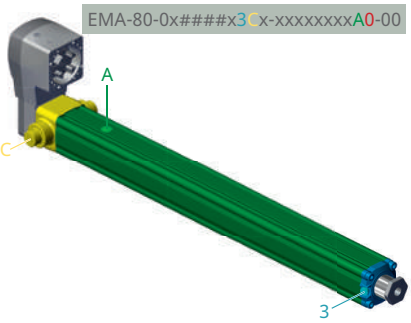
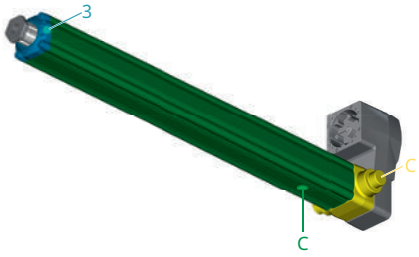
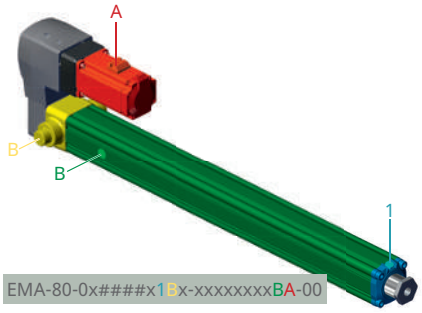


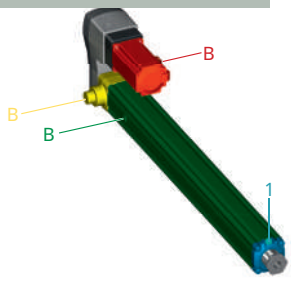
EMA-80-0x####x3Cx-xxxxxxxxC0-00



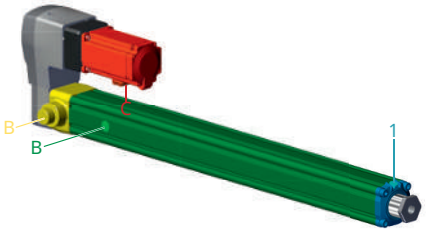


EMA-80-0x####x1Bx-xxxxxxxxBA-00

EMA-80-0x####x1Bx-xxxxxxxxBB-00



EMA-80-0x####x1Bx-xxxxxxxxBC-00

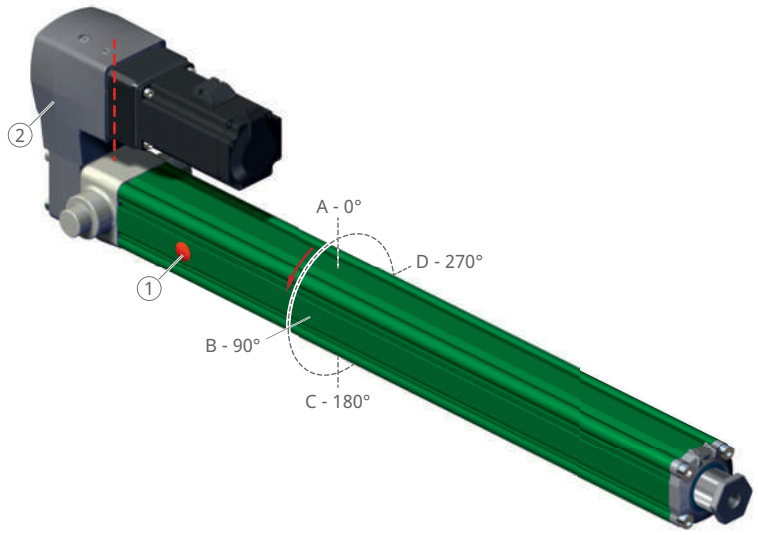


5.1.1 0°reference for linear unit

The 0°reference of the linear unit is the relubrication port.

The linear unit can be rotated clockwise in 90°increments.

48 Possible orientation of the linear unit

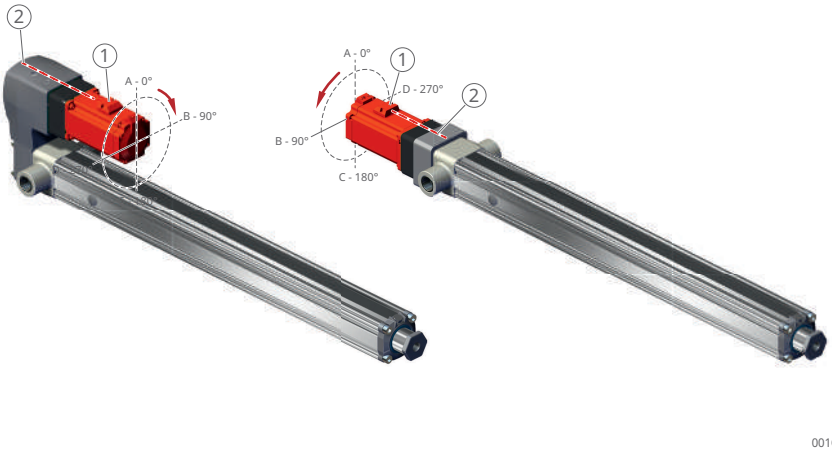


1	Position of the relubrication port	2	Position of the gearbox

5.1.2 0° reference for motor

The 0° reference for the motor is the gearbox position. The motor can be rotated in 90° increments.

49 Motor orientation relative to gearbox

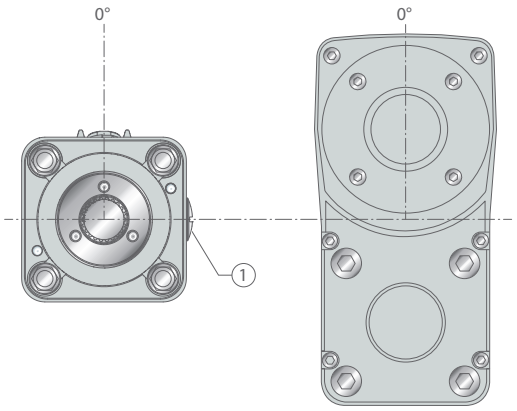


1	Position of the motor cables	2	Position of the gearbox

5.1.3 0° reference for attachment to parallel gearbox

The 0°reference of the attachment on the parallel gear is the relubrication port.

50 0° reference for attachment to parallel gearbox

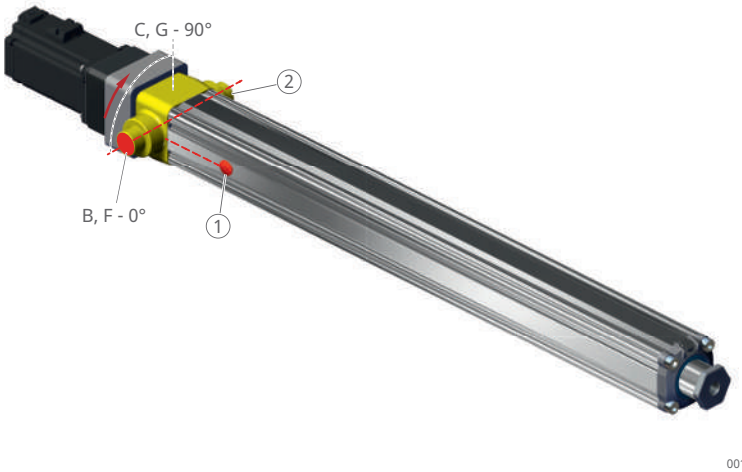


1	Relubrication port		

5.1.4 0° reference for attachment to bearing housing

The 0°reference of the attachment on the bearing housing is the relubrication port. The bearing housing with male trunnion mount must be offset by 90.° In configuration with the parallel gearbox, the male trunnion mounts must be installed offset to the relubrication opening on the linear unit by at least 90.°

51 Possible orientation of the attachment on the bearing housing to the linear unit



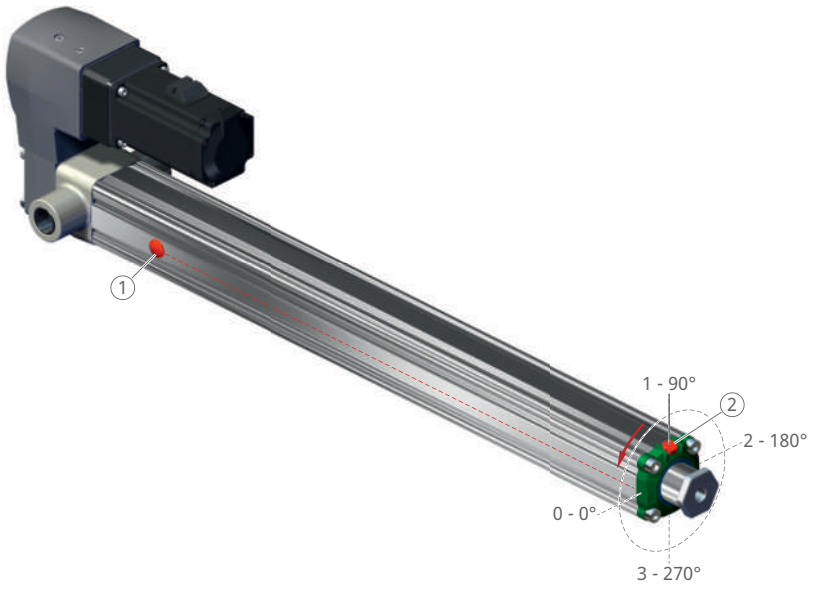
1	Position of the relubrication port	2	Position of the male trunnion mounts

5.1.5 0° reference for front cover with vent plug

The 0°reference of the front cover with vent plug is the relubrication port. The front cover with vent plug can be rotated in 90°increments.

The front cover with vent plug must be protected against water accumulation. The installation orientation must be selected accordingly.

52 Possible orientation of the front cover with vent plug



1	Position of the relubrication port	2	Position of the vent plug

5.2 Complete EWELLIX electric actuator

53 Typekey for complete EMA-80 (part 1)

Product version
EWELLIX electric actuator EMA-80

Screw type
C Ball screw 32×10 without backup nut
D Ball screw 32×10 with backup nut

Stroke
... Stroke in mm
1500

Push tube and primary attachment
1 Male thread M27
A + with mounted rod end
B + with mounted rod clevis
3 Female thread M20
G + with mounted rod end
T T-bar 1", W = 100 mm
U T-bar 1", W = 131 mm

Front cover orientation (relative to relubrication port)
0 Orientation vent plug 0°
1 Orientation vent plug 90°
2 Orientation vent plug 180°
3 Orientation vent plug 270°

Secondary attachment bearing housing (relative to relubrication port)
A No attachment
B Male trunnion mount 1", W = 131mm, 0°
C Male trunnion mount 1", W = 131mm, 90°
F Female trunnion mount 1", W = 131mm, 0°
G Female trunnion mount 1", W = 131mm, 90°

Limit switch
0 None
1 2 x magnet sensors mounted, PNP normally closed (NC)

Gearbox type and ratio
S B Spur gearbox, 3-stage, i4, grease lubrication
S C Spur gearbox, 3-stage, i12, grease lubrication
S D Spur gearbox, 3-stage, i20, grease lubrication
S F Spur gearbox, 2-stage, i10, grease lubrication
D A Inline gearbox, i1

Secondary attachment parallel gearbox and orientation
0 0 No rear attachment
B 0 Plain bearing ID = 25 mm, 0°
B 1 Plain bearing ID = 25 mm, 90°
B 2 Plain bearing 1", 0°
B 3 Plain bearing 1", 90°
S 0 Spherical, 0°
S 1 Spherical, 90°
T 0 T-bar 1", W = 100

Options
0 Cover

001C5A45

54 Typekey for complete EMA-80 (part 2)

Motor and motor adapter

0 0 0	No motor or motor adapter
	Motor adapter only
*** * #**	Other standard adapter according to table
	Motor is included in the scope of delivery and mounted by Schaeffler. Required adapters are included.
F 1 1	Fulling FL80SV75 2Nm brake, no manual release, DC 24 V
F 1 3	Fulling FL80SV75 10Nm brake, no manual release, DC 24 V
F 1 4	Fulling FL80SV75 10Nm brake, with manual release, DC 24 V

Orientation of the linear unit (relubrication port to gearbox)

A	0°
B	90°
C	180°
D	270°

Orientation of the motor

0	No motor mounted
A	0°
B	90°
C	180°
D	270°

Customer Options

0 0	No options

001C5A8A

6 Declaration of Conformity

18 Declaration of Conformity

Test	Standard	Power
Static safety	ANSI/SAIA A92.20:2018	Safety factor: 2 · F_{max}, without plastic deformation [1)]
Mechanical overload	ANSI/SAIA A92.20:2018	Safety factor: 2.5 · F_{max}, without material failure or material breakdown [1)]
Recirculating ball screw system	ANSI/SAIA A92.20:2018 Section 4.5.4.3	Compliant for option EMA-80-1-C
Anti-corrosion protection	DIN EN ISO 9227:2017 NSS ASTM B117-19	• Salt spray test: NaCl solution 5 ±0.5 %pH: 6.5 ... 7.2 • Test temperature: 35 ±2 °C • Test duration: 144 h • No red dust discharge
Degree of protection	IEC 60529:2013 (Issue 2.2)	IP65S IP65M
Vibrations	EN 60068-2-64:2008 MIL-STD 810G Method 514.6, Annex C, Figure 514.6C-1 MIL-STD 810G Method 514.6, Annex C, Figure 514.6C-2 MIL-STD 810G Method 514.6, Annex D, Figure 5104.6D-9	Full performance after test
other	RoHS Directive 2011/95/EU compliant REACH Regulation (EC) 1907/2006 compliant Dodd-Frank Act compliant	

1) Dependent on stroke configuration

Schaeffler Technologies AG & Co. KG
Georg-Schäfer-Straße 30
97421 Schweinfurt
Germany
www.schaeffler.de/en
info.de@schaeffler.com

In Germany:
Phone 0180 5003872
From other countries:
Phone +49 9721 91-0

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