EWELLIX

EWELLIX Linear Actuator

MATRIX

Product Data Sheet

We pioneer motion

SCHAEFFLER

Contents

1 MATRIX

The MATRIX series has been developed for medical devices and includes powerful linear AC actuators and DC actuators with direct current motors.

EWELLIX MATRIX linear actuators operate very quietly, require minimal space, and can be installed at almost any angle in a vertical or horizontal position. The series is medically approved. The Matrix series can be supplied as a complete system including control units, operating devices, and accessories.

Characteristics

- developed for medical devices
- medically approved
- complete system including control units, operating devices, and accessories
- back-up nut as standard
- safety factor of up to 4

Benefits

- synchronization possible
- low-noise operation with smooth running
- compact and aesthetic design
- available as an option:
  - anti-pinching protection
  - incremental position feedback
  - emergency lowering

1.1 MAX1

1 Linear actuator MAX1

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Benefits

- low-noise operation
- complete system including control unit, operating devices, and accessories
- synchronization possible
- compact and aesthetically pleasing
- back-up nut as standard

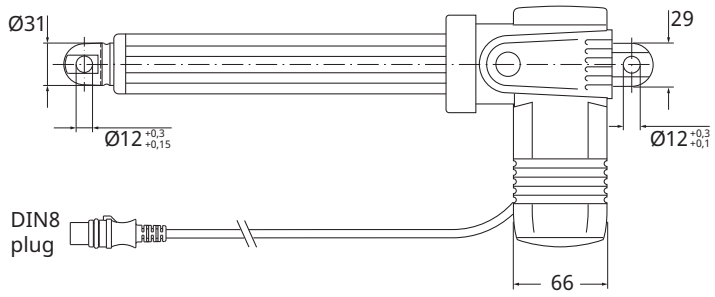
1 Technical data MAX1

Feature	Unit	MAX1..-A	MAX1..-B	MAX1..-C
Rated push force	N	4000	2000	1500
Rated pull force	N	4000	2000	1500
min. speed (full load)	mm/s	5	6	13
max. speed (no load)	mm/s	7	9	18
min. stroke S	mm	50	50	50
max. stroke S	mm	700	700	700
Retracted length L	mm	S + 195 / 260 [1)]	S + 195 / 260 [1)]	S + 195 / 260 [1)]
Voltage	V DC	24	24	24
Power consumption	W	120	120	120
Current consumption	A	5	5	5
Duty cycle	%	10 ($^1/_9$)	10 ($^1/_9$)	10 ($^1/_9$)
min. ambient temperature	°C	0	0	0
max. ambient temperature	°C	+40	+40	+40
Protection code (IP)	–	IP66S	IP66S	IP66S
Weight (at 200 mm stroke)	kg	4	3.7	3.6
Color	–	Gray	Gray	Gray

1) For S ≤ 350 mm: L = 195 + S
For S > 350 mm: L = 260 + S

Dimensional drawings

2 Side view



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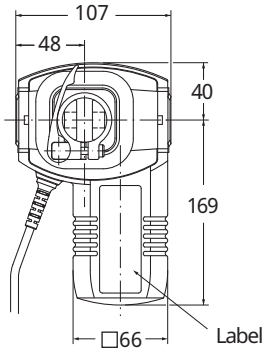
3 Front view



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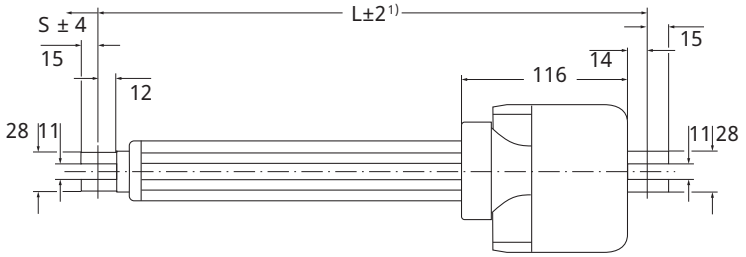
4 Top view



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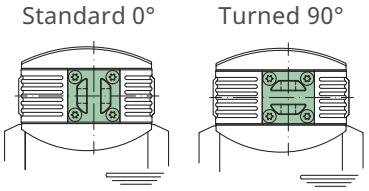
5 Rear mounting



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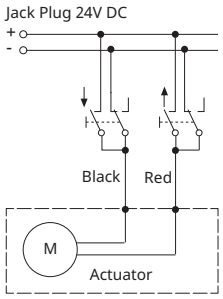
Wiring diagrams

6 Jack plug DC 24 V



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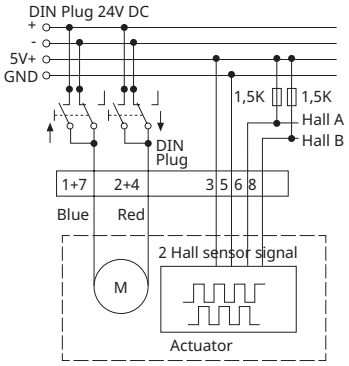
7 DIN-8 plug DC 24 V



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Valid for MAX 11 only. MAX 10 must be operated using a BCU, VCU, SCU, or MCU control unit.

Suitable control units and accessories

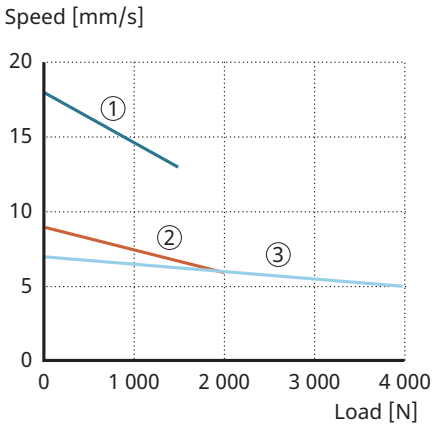
2 Suitable operating elements and control units

Operating elements	Switches	Control unit			
		SCU	VCU	BCU	MCU
EHA1	M	–	–	–	✓
EHA3	M	✓	✓	✓	–
STJ	F	✓	✓	✓	–
STF	F	–	–	–	✓
STE	T	✓	✓	✓	–
STA	T	–	–	–	✓

M Hand switch
F Foot switch
T Desk switch
✓ suitable
– not suitable

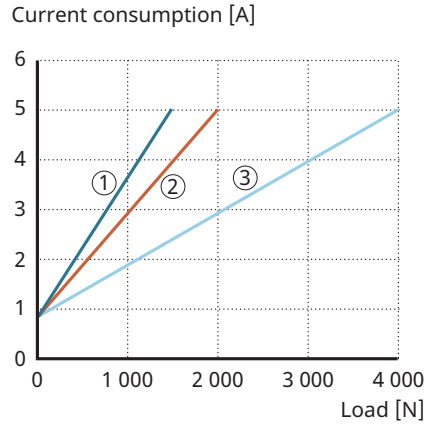
Performance diagrams

8 Speed-load diagram



1	MAX1..-C	2	MAX1..-B
3	MAX1..-A		

9 Current-load diagram

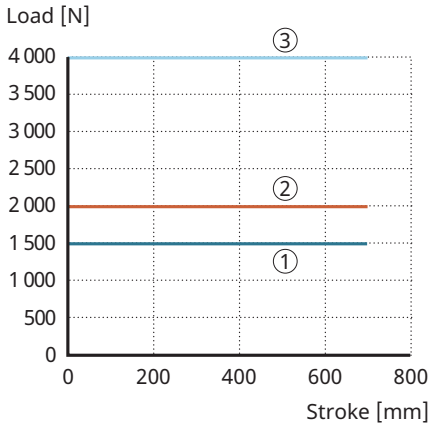


1	MAX1..-C	2	MAX1..-B
3	MAX1..-A		

1

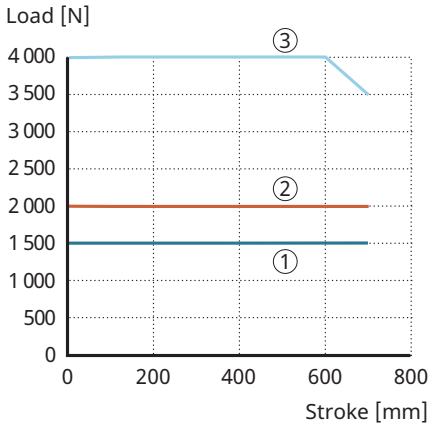
Load limit

10 Load limit (push and pull) for safety factor SF =1



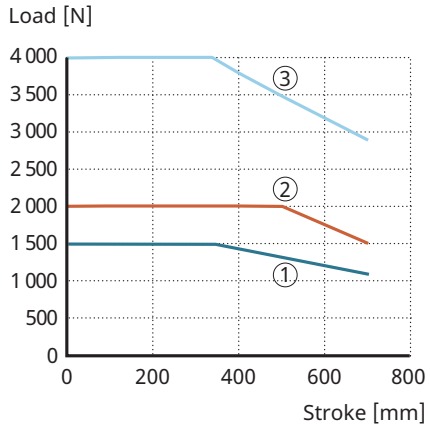
1	MAX1..-C	2	MAX1..-B
3	MAX1..-A		

11 Load limit (push and pull) for safety factor SF =2



1	MAX1..-C	2	MAX1..-B
3	MAX1..-A		

12 Load limit (push and pull) for safety factor SF = 4 (EN 60601)



1	MAX1..-C	2	MAX1..-B
3	MAX1..-A		

Ordering key

13 Ordering designation

MAX1	0	–	A	050 245	A	0B	0	0	0	0	000

Type

Voltage

0	DC 24 V
1	DC 24 V with integrated current shutdown

Load

A	4000 N
B	2000 N
C	1500 N

Stroke (S)

050 245	50 mm
100 295	100 mm
150 345	150 mm
200 395	200 mm
250 445	250 mm
300 495	300 mm
350 545	350 mm
400 660	400 mm
450 710	450 mm
500 760	500 mm
550 810	550 mm
600 860	600 mm
650 910	650 mm
700 960	700 mm
– – – – – –	Other stroke lengths; 50 < S < 700 mm, available on request

Cable/connecting plug

0B	Coiled cable, 0.75 m (not extended) / DIN-8 plug, available on request
C5	Straight cable, 2.5 m / DIN-8 plug
0A	Coiled cable, 0.75 m (not extended) / jack plug
25	Straight cable, 2.5 m / jack plug
– –	Cables in special lengths available on request

Alignment of rear attachment

0	No fork head (customized option)
1	Standard (in accordance with drawing)
2	Rotated by 90°

Option 1

0	No option, only valid for linear actuator “A” (push and pull)
E	Quick release + EKZm, push, fork head bore parallel to button (for linear actuator in version “C”, L = +115 mm)[1)]
F	Quick release + EKZm, push, fork head bore at 90° to button (for linear actuator in version “C”, L = +115 mm)[1)]
M	Push load direction, for linear actuator in version “B” and “C”
N	Pull load direction, for linear actuator in version “B” and “C”

Option 2

0	No option
F	Dual Hall encoder, DIN-8 plug
M	Service life monitoring, available on request
P	Service life monitoring, dual Hall encoder, DIN-8 plug, available on request

Option 3

–	No option
V	Emergency lowering, fork head bore parallel to clamping lever (for linear actuator in version “A”, L+30 mm)
W	Emergency lowering, fork head bore at 90° to clamping lever (for linear actuator in version “A”, L+30 mm), available on request

Customization

[1)] EKZm: mechanical anti-pinching protection, min. stroke 150 mm to 300 mm

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1.2 MAX3

14 Linear actuator MAX3

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Benefits

- low-noise operation
- complete system including control unit, operating devices, and accessories
- synchronization possible
- compact and aesthetically pleasing
- back-up nut as standard

3 Technical data MAX3

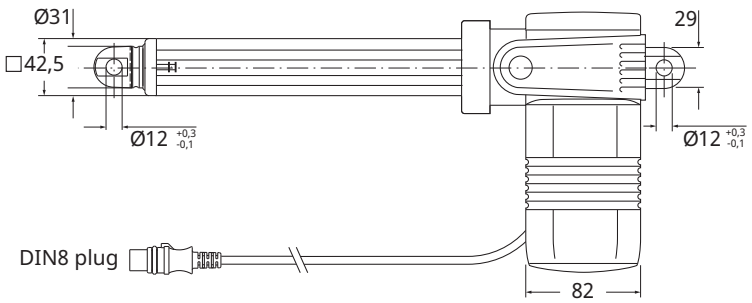
Feature	Unit	MAX3..-A	MAX3..-B	MAX3..-C
Rated push force	N	8000	4000	3000
Rated pull force	N	6000 [1)]	4000	3000
min. speed (full load)	mm/s	5	6	13
max. speed (no load)	mm/s	7	9	18
min. stroke S	mm	50	50	50
max. stroke S	mm	700	700	700
Retracted length L	mm	S + 215 / 280 [2)]	S + 215 / 280 [2)]	S + 215 / 280 [2)]
Voltage	V DC	12 / 24	12 / 24	12 / 24
Power consumption	W	120	120	120
Current consumption	A	5	5.2	5.2
Duty cycle	%	10 ($^1/_9$)	10 ($^1/_9$)	10 ($^1/_9$)
min. ambient temperature	°C	0	0	0
max. ambient temperature	°C	+40	+40	+40
Protection code (IP)	–	IP66S	IP66S	IP66S
Weight (at 200 mm stroke)	kg	4.5	4.2	4
Color	–	Gray	Gray	Gray

1) The max. load for medical applications is 5000 N.

2) For S ≤ 350 mm: L = 215 + S
For S > 350 mm: L = 280 + S

Dimensional drawings

15 Side view



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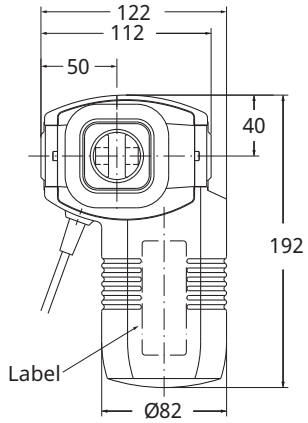
16 Front view



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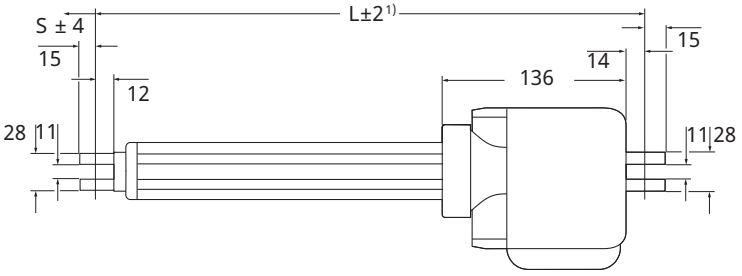
17 Top view



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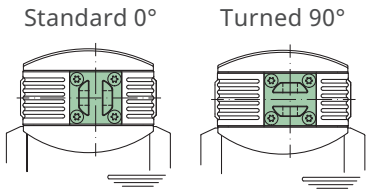
18 Rear mounting



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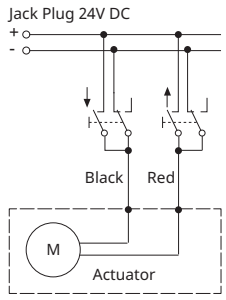
Wiring diagrams

19 Jack plug DC 24 V



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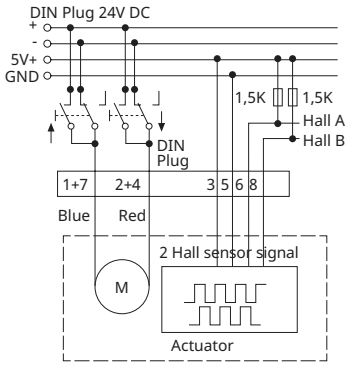
20 DIN-8 plug DC 24 V



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Valid for MAX 31 only. MAX 30 must be operated using a BCU, VCU, SCU, or MCU control unit.

Suitable control units and accessories

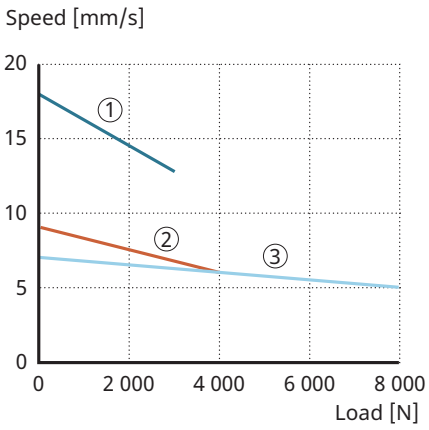
4 Suitable operating elements and control units

Operating elements	Switches	Control unit			
		SCU	VCU	BCU	MCU
EHA1	M	–	–	–	✓
EHA3	M	✓	✓	✓	–
STJ	F	✓	✓	✓	–
STF	F	–	–	–	✓
STE	T	✓	✓	✓	–
STA	T	–	–	–	✓

M Hand switch
F Foot switch
T Desk switch
✓ suitable
– not suitable

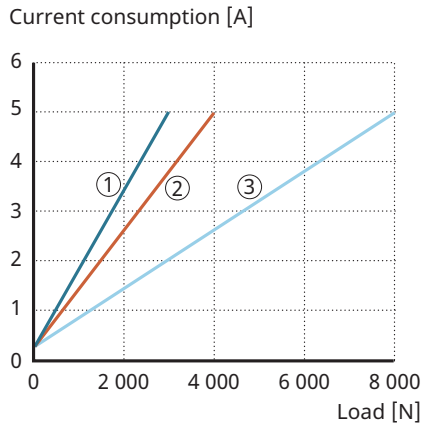
Performance diagrams

21 Speed-load diagram



1	MAX3..-C	2	MAX3..-B
3	MAX3..-A		

22 Current-load diagram

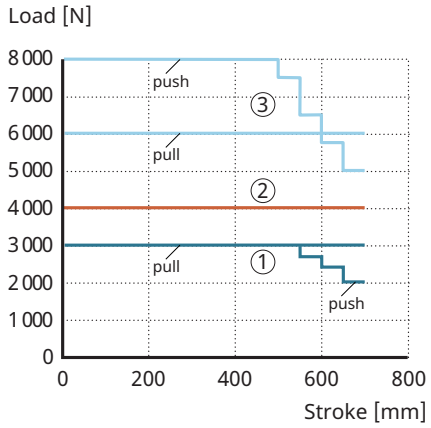


1	MAX3..-C	2	MAX3..-B
3	MAX3..-A		

1

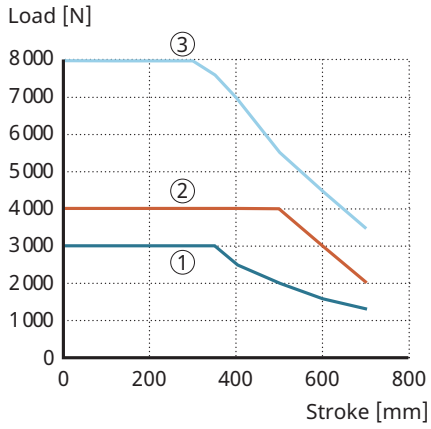
Load limit

23 Load limit (push and pull) for safety factor SF =1



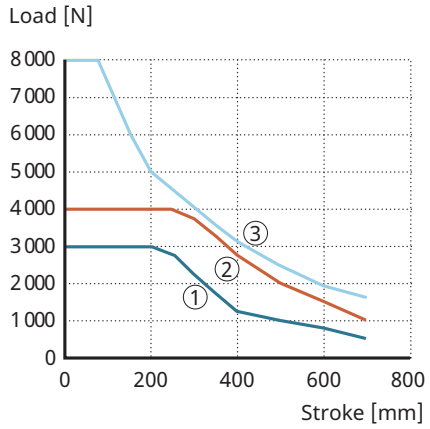
1	MAX3..-C	2	MAX3..-B
3	MAX3..-A		

24 Load limit (push and pull) for safety factor SF =2



1	MAX3..-C	2	MAX3..-B
3	MAX3..-A		

25 Load limit (push and pull) for safety factor SF = 4 (EN 60601)



1	MAX3..-C	2	MAX3..-B
3	MAX3..-A		

Ordering key

26 Ordering designation

MAX3 | 0 | – | A | 050 265 | A | 0B | 0 | 0 | 0 | 0 | 000

Type

Voltage

0	DC 24 V
1	DC 24 V with integrated current shutdown, available on request
2	DC 12 V, available on request

Load

A	8000 N
B	4000 N
C	3000 N

Stroke (S)

050 265	50 mm
100 315	100 mm
150 365	150 mm
200 415	200 mm
250 465	250 mm
300 515	300 mm
350 565	350 mm
400 680	400 mm
450 730	450 mm
500 780	500 mm
550 830	550 mm
600 880	600 mm
650 930	650 mm
700 980	700 mm
– – – – – –	Other stroke lengths; 50 < S < 700 mm, available on request

Cable/connecting plug

0B	Coiled cable, 0.75 m (not extended) / DIN-8 plug, available on request
C5	Straight cable, 2.5 m / DIN-8 plug
0A	Coiled cable, 0.75 m (not extended) / jack plug
25	Straight cable, 2.5 m / jack plug
––	Cables in special lengths, available on request

Alignment of rear attachment

0	No fork head (customized option)
1	Standard (in accordance with drawing)
2	Rotated by 90°, available on request

Option 1

0	No option, only valid for linear actuator “A” (push and pull)
E	Quick release + EKZm, push, fork head bore parallel to button (for linear actuator in version “C”, L = +115 mm)[1)]
F	Quick release + EKZm, push, fork head bore at 90° to button (for linear actuator in version “C”, L = +115 mm)[1)], available on request
K	Electrical anti-pinching protection, motor direction pull
L	Electrical anti-pinching protection, motor direction push
M	Push load direction, for linear actuator in version “B” and “C”
N	Pull load direction, for linear actuator in version “B” and “C”

Option 2

0	No option
F	Dual Hall encoder, DIN-8 plug
M	Service life monitoring, available on request
P	Service life monitoring, dual Hall encoder, DIN-8 plug, available on request

Option 3

–	No option
V	Emergency lowering, fork head bore parallel to clamping lever (for linear actuator in version “A”, L+30 mm)
W	Emergency lowering, fork head bore 90° to clamping lever, available on request (for linear actuator in version “A”, L+30 mm)

Customization

[1)] EKZm: mechanical anti-pinching protection, min. stroke 150 mm to 300 mm

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1.3 MAX7

27 Linear actuator MAX7

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Benefits

- wide-range power supply
- operational readiness indicator
- plug and play with integrated control unit
- developed for medical products, in accordance with IEC 60601-1

5 Technical data MAX7

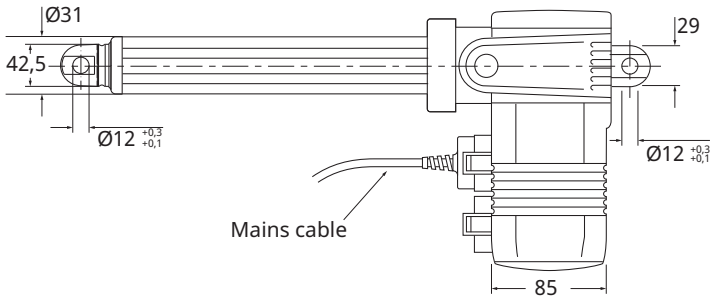
Feature	Unit	MAX7..-A	MAX7..-B	MAX7..-C
Rated push force	N	8000	4000	3000
Rated pull force	N	6000 [1]	4000	3000
min. speed (full load)	mm/s	6	8	13
max. speed (no load)	mm/s	7.5	10	18
min. stroke S	mm	50	50	50
max. stroke S	mm	700	700	700
Retracted length L	mm	S + 215 / 280 [2]	S + 215 / 280 [2]	S + 215 / 280 [2]
Voltage	V AC	100 ... 240 at 50/60 Hz	100 ... 240 at 50/60 Hz	100 ... 240 at 50/60 Hz
Power consumption	W	180	180	180
Current consumption at AC 100 V	A	3.2	3.2	3.2
Current consumption at AC 240 V	A	1.6	1.6	1.6
Duty cycle	%	10 ($^1/_9$)	10 ($^1/_9$)	10 ($^1/_9$)
min. ambient temperature	°C	0	0	0
max. ambient temperature	°C	+40	+40	+40
Protection code (IP)	–	IP66S	IP66S	IP66S
Weight (at 200 mm stroke)	kg	4.8	4.5	4.2
Color	–	Gray	Gray	Gray

[1] The max. load for medical applications is 5000 N.

[2] For S ≤ 350 mm: L = 215 + S
For S > 350 mm: L = 280 + S

Dimensional drawings

28 Side view



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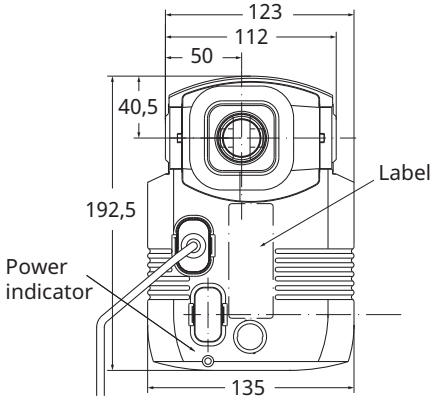
29 Front view



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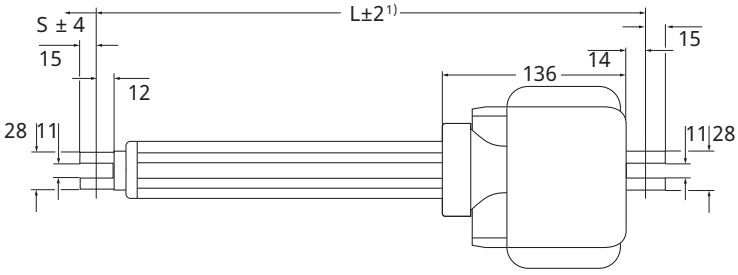
30 Top view



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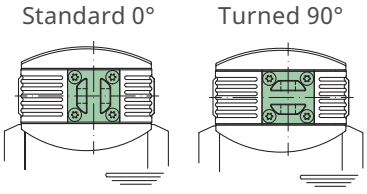
31 Rear mounting



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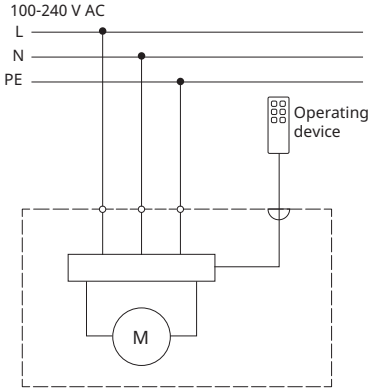
Wiring diagrams

32 Connection diagram AC 100 ... 240 V



Suitable control units and accessories

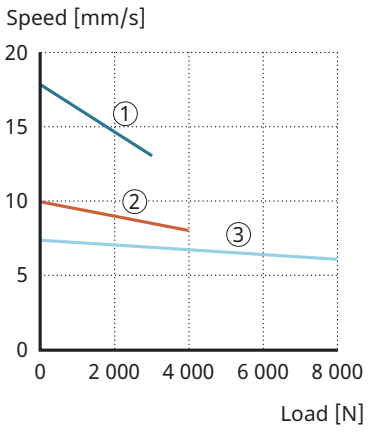
6 Suitable operating elements and control units

Operating elements	Switches	MAX70	MAX72/74
EHA1	M	–	✓
PHC	M	✓	–
STF	F	–	✓
PFP	F	✓	–
STA	T	–	✓
PAM	T	✓	–

M Hand switch
F Foot switch
T Desk switch
✓ suitable
– not suitable

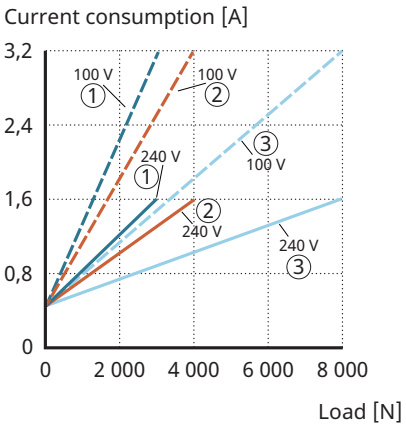
Performance diagrams

33 Speed-load diagram



1	MAX7..-C	2	MAX7..-B
3	MAX7..-A		

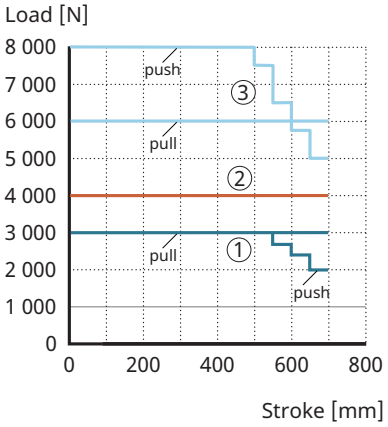
34 Current-load diagram



1	MAX7..-C	2	MAX7..-B
3	MAX7..-A		

Load limit

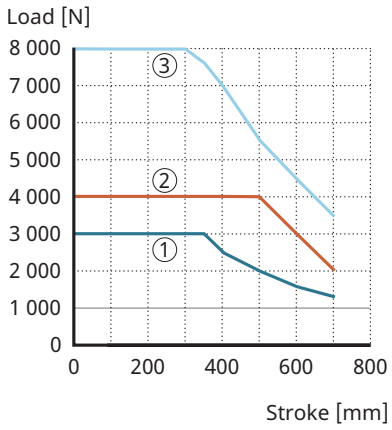
35 Load limit (push and pull) for safety factor SF =1



1	MAX7..-C	2	MAX7..-B
3	MAX7..-A		

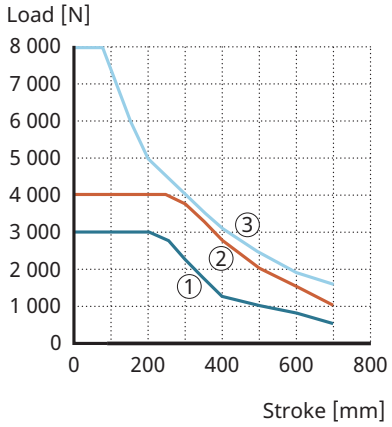
1

36 Load limit (push and pull) for safety factor SF =2



1	MAX7..-C	2	MAX7..-B
3	MAX7..-A		

37 Load limit (push and pull) for safety factor SF = 4 (EN 60601)



1	MAX7..-C	2	MAX7..-B
3	MAX7..-A		

7 Accessories

Accessories	Plug	Country	Ordering designation	Order number
Straight cable 3.5 m	Schuko	DE	ZKA-140306-3500	0121723
Straight cable 3.5 m	SEV	CH	ZKA-140316-3500	0121737
Straight cable 3.5 m	UL	USA	ZKA-140355-3500	0121724
Straight cable 3.5 m	Hospital-grade plug	USA	ZKA-140360-3500	0121732
Straight cable 3.5 m	British plug	UK	ZKA-140350-3500	0121743
Coiled cable 1.2 m/2.2 m	Schuko	DE	ZKA-140342-1500	0121728
Straight polyurethane cable 3.5 m	SEV	CH	ZKA-140426-3500	0121740
Strain relief for mains cable	–	–	ZUB-952253	0102848
Tool for plugs (jack plug/D-sub/power supply)	–	–	ZWS-140375	0125322

Ordering key

38 Ordering designation

MAX7	0	–	A	050 245	A	0	0	0	0	V	000

Type

Voltage

0	AC 100-240 V/50-60 Hz, integrated pneumatic control
2	AC 100-240 V/50-60 Hz, integrated low-voltage control with additional 24 V output
4	AC 100-240 V/50-60 Hz, integrated low-voltage control

Load

A	4000 N
B	2000 N
C	3000 N

Stroke (S)

050 265	50 mm
100 315	100 mm
150 365	150 mm
200 415	200 mm
250 465	250 mm
300 515	300 mm
350 565	350 mm
400 680	400 mm
450 730	450 mm
500 780	500 mm
550 830	550 mm
600 880	600 mm
650 930	650 mm
700 980	700 mm
––––––	Other stroke lengths; 50 < S < 700 mm, available on request

Cable/connecting plug

0	No cable

Alignment of rear attachment

0	No fork head (customized option)
1	Standard (in accordance with drawing)
2	Rotated by 90°, available on request

Option 1

0	No option, only valid for linear actuator “A” (push and pull)
E	Quick release + EKZm, push, fork head bore parallel to button (for linear actuator in version “C”, L = +115 mm)[1)]
F	Quick release + EKZm, push, fork head bore at 90° to button (for linear actuator in version “C”, L = +115 mm)[1)], available on request
K	Electrical anti-pinching protection, motor direction pull, available on request
L	Electrical anti-pinching protection, motor direction push, available on request
M	Push load direction, for linear actuator in version “B” and “C”
N	Pull load direction, for linear actuator in version “B” and “C”

Option 2

0	No option

Option 3

-	No option
V	Emergency lowering, fork head bore parallel to clamping lever (for linear actuator in version “A”, L+30 mm)
W	Emergency lowering, fork head bore at 90° to clamping lever (for linear actuator in version “A”, L+30 mm), available on request

Customization

[1)] EKZm: mechanical anti-pinching protection, min. stroke 150 mm to 300 mm

001DF32E

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PDB 79 / 01 / en-US / 2026-04