



Matrix series

Linear Actuators

Product Data Sheet

1 Introduction

The Matrix series has been developed for medical devices and includes powerful linear AC actuators and DC actuators with a direct current motor.

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.

Features

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

Benefits

- synchronization possible
- silent operation with smooth running
- compact and aesthetically pleasing
- available as an option:
 - anti-pitching
 - incremental position feedback
 - emergency lowering

2 Matrix - MAX1

🔗1 Linear drive MAX1



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2.1 Performance overview

2.1.1 Technical data

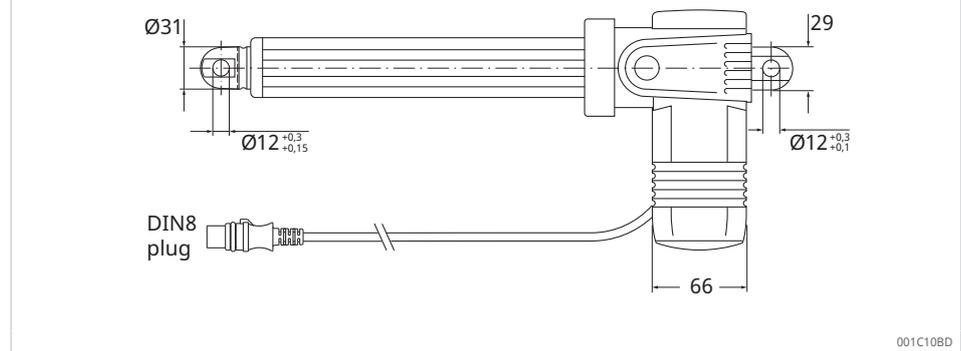
📊1 Technical data

Feature	Unit	MAX1..A..	MAX1..B..	MAX1..C..
Rated push load	N	4000	2000	1500
Rated pull load	N	4000	2000	1500
min. speed (full load)	mm/s	5	6	13
max. speed (no load)	mm/s	7	9	18
min. stroke	mm	50	50	50
max. stroke	mm	700	700	700
Retracted length	mm	Stroke + 195/260 ¹⁾	Stroke + 195/260 ¹⁾	Stroke + 195/260 ¹⁾
Voltage	VDC	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
Degree of protection	IP	66S	66S	66S
Weight (at 200 mm stroke)	kg	4	3.7	3.6
Color	-	Gray	Gray	Gray

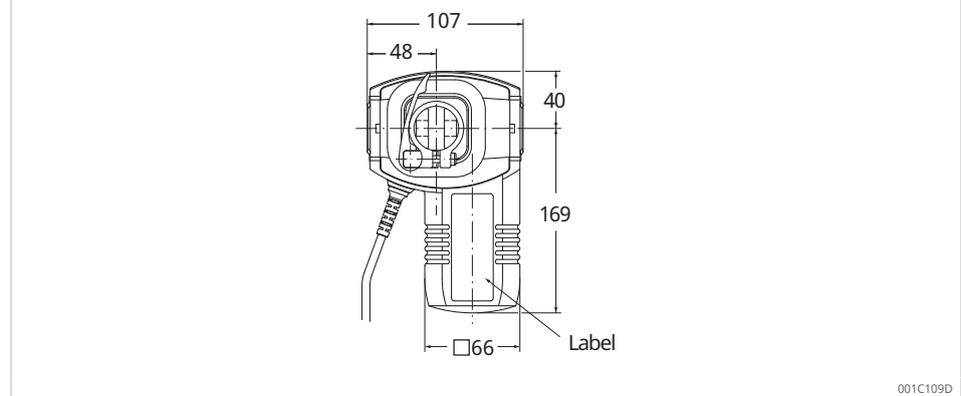
¹⁾ For strokes ≤ 350 mm: L = 195 + stroke
For strokes > 350 mm: L = 260 + stroke

2.1.2 Geometric data

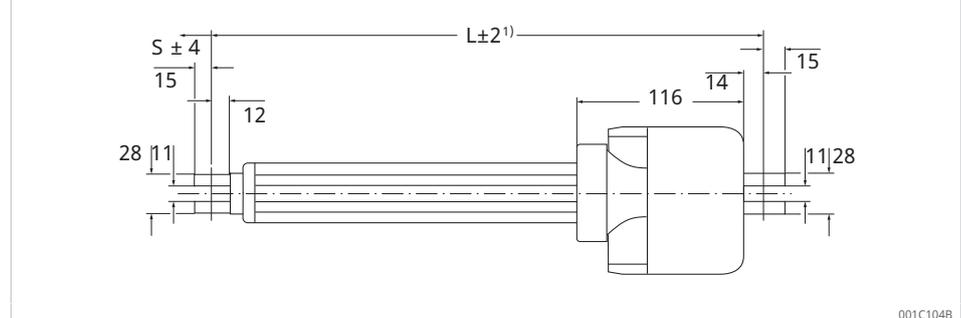
2 Side view



3 Front view

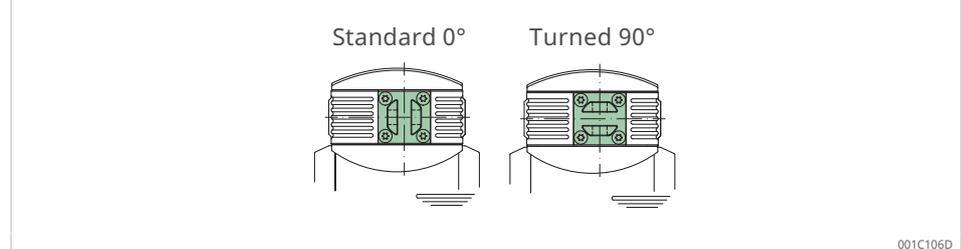


4 Top view



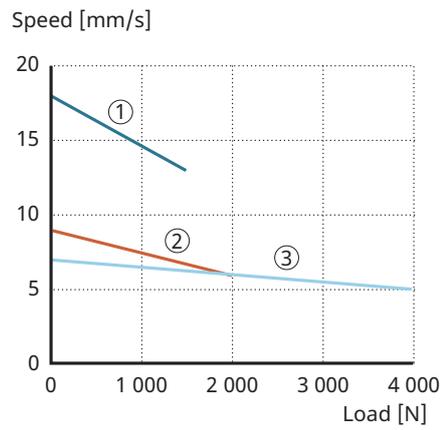
- 1) For strokes ≤ 350 mm: $L = 195 + \text{stroke}$
For strokes > 350 mm: $L = 260 + \text{stroke}$

5 Rear mounting



2.1.3 Speed and load

6 Speed-load diagram

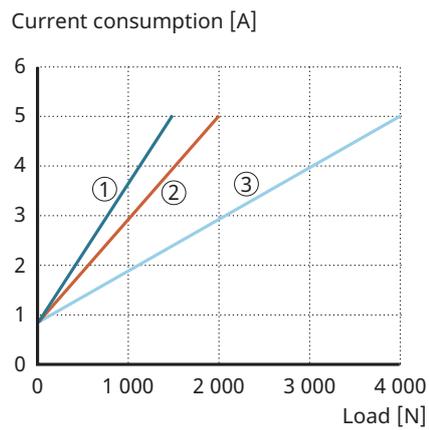


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1	Push load reduction static 1500 N	2	Push load reduction static 2000 N
3	Push load reduction static 4000 N		

2.1.4 Current and load

7 Current-load diagram

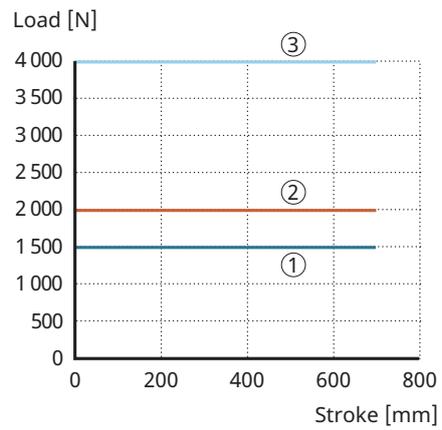


001C112D

1	Push load reduction static 1500 N	2	Push load reduction static 2000 N
3	Push load reduction static 4000 N		

2.1.5 Safety factor load conditions

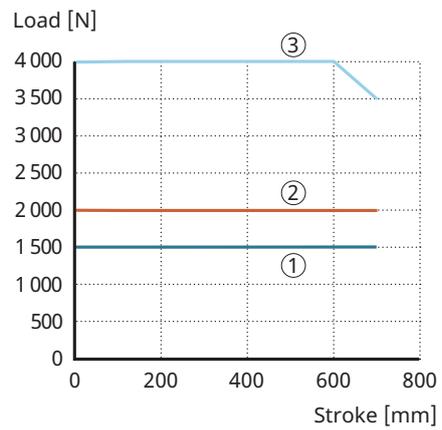
8 Push load reduction, static safety factor $S = 1$



001C113D

1	Rated compression force 1500 N	2	Rated compression force 2000 N
3	Rated compression force 4000 N		

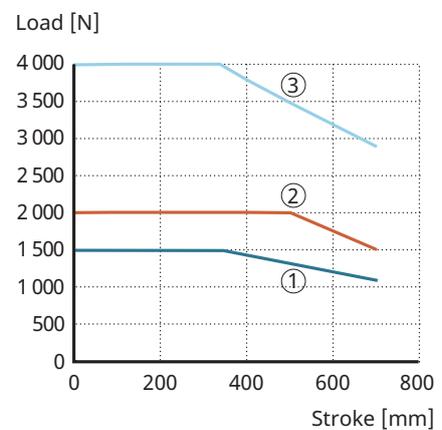
9 Push load reduction, static safety factor $S = 2$



001C114D

1	Rated compression force 1500 N	2	Rated compression force 2000 N
3	Rated compression force 4000 N		

10 Push load reduction, static safety factor $S = 4$ (EN 60601)



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1	Rated compression force 1500 N	2	Rated compression force 2000 N
3	Rated compression force 4000 N		

2.2 Control unit

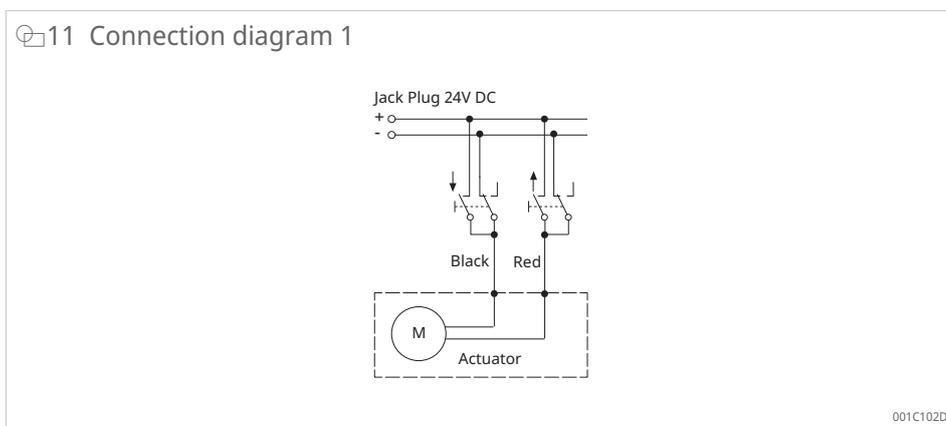
2.2.1 Control units and accessories

2.2.1.1 Operating elements and control units

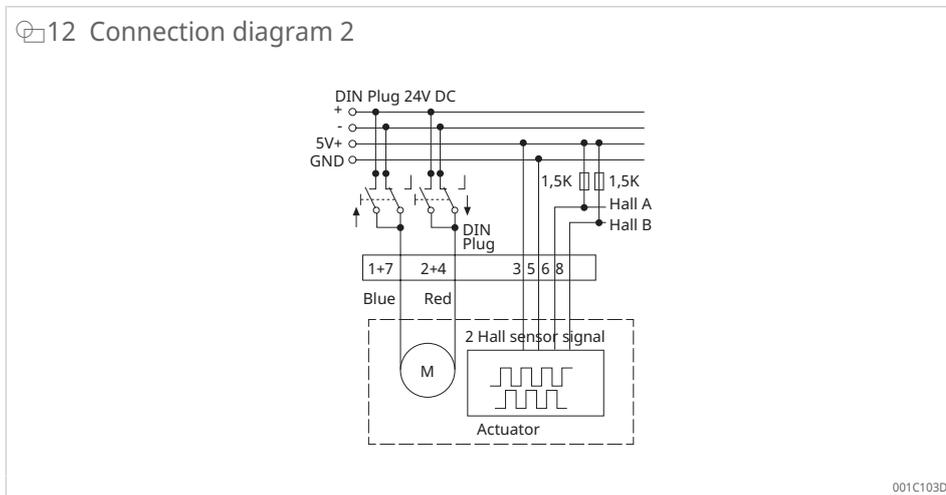
Operating elements	Control unit			
	SCU	VCU	BCU	MCU
EHA 1	-	-	-	Hand switch
EHA 3	Hand switch	Hand switch	Hand switch	-
STJ	Foot switch	Foot switch	Foot switch	-
STF	-	-	-	Foot switch
STE	Desk switch	Desk switch	Desk switch	-
STA	-	-	-	Desk switch

2.2.2 Connection

2.2.2.1 Connection diagram 1



2.2.2.2 Connection diagram 2



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

2.3 Ordering key

13 Ordering key

Type

Voltage

0	24V DC
1	24 V DC with integrated current cut-off

Load

A	4 000 N
B	2 000 N
C	1 500 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

Cable / Connecting plug

0 B	Coiled, 0,75 m (not stretched) / DIN8 plug
C 5	Straight, 2,5 m / DIN8 plug
0 A	Coiled, 0,75 m (not stretched) / Jack plug
2 5	Straight, 2,5 m / Jack plug
--	Special cable length on request

Orientation of rear attachment

0	No fork head (customized option)
1	Standard (as drawing)
2	Turned 90°

Option 1

0	No option, only valid for actuator "A" (push and pull)
E	Quick-release +EKZm, push, fork head bore parallel to button (for actuator design "C" is L= +115 mm) ¹⁾
F	Quick-release +EKZm, push, fork head bore 90° to button (for actuator design "C" is L= +115 mm) ¹⁾
M	Push load, for actuator version "B" and "C"
N	Pull load, for actuator version "B" and "C"

Option 2

0	No option
F	2-Hall encoder, DIN8 plug

Option 3

0	No option
V	Emergency lowering, fork head bore parallel to clamping lever (for actuator design "A", L+30 mm)
W	Emergency lowering, fork head bore 90° to clamping lever (for actuator design "A", L+30 mm)

Customized

001C117A

¹⁾ EKZm: mechanical anti-pinching device, min. stroke 150 mm to 300 mm
Options shown in red are available on request only.

3 Matrix - MAX3

14 Linear drive MAX3



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3.1 Performance overview

3.1.1 Technical data

3 Technical data

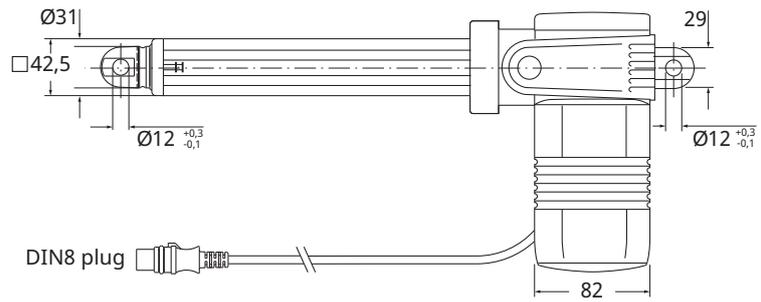
Feature	Unit	MAX3..A..	MAX3..B..	MAX3..C..
Rated push load	N	8000	4000	3000
Rated pull load	N	6000 ¹⁾	4000	3000
min. speed (full load)	mm/s	5	6	13
max. speed (no load)	mm/s	7	9	18
min. stroke	mm	50	50	50
max. stroke	mm	700	700	700
Retracted length	mm	Stroke + 215/280 ²⁾	Stroke + 215/280 ²⁾	Stroke + 215/280 ²⁾
Voltage	VDC	12 oder 24	12 oder 24	12 oder 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
Degree of protection	IP	66S	66S	66S
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 strokes ≤ 350 mm: L = 215 + stroke
For strokes > 350 mm: L = 280 + stroke

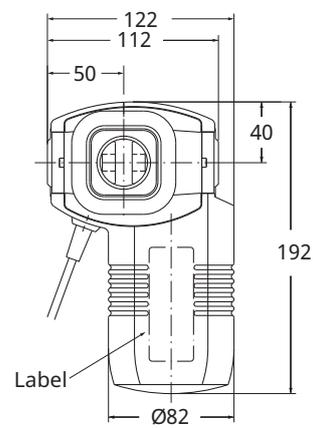
3.1.2 Geometric data

15 Side view



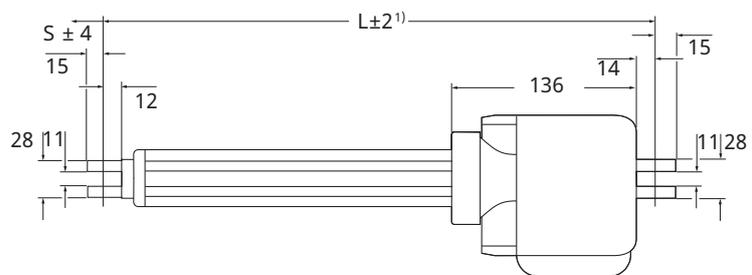
001C11CD

16 Front view



001C11A0

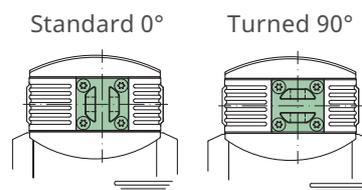
17 Top view



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- 1) For strokes ≤ 350 mm: $L = 215 + \text{stroke}$
 For strokes > 350 mm: $L = 280 + \text{stroke}$

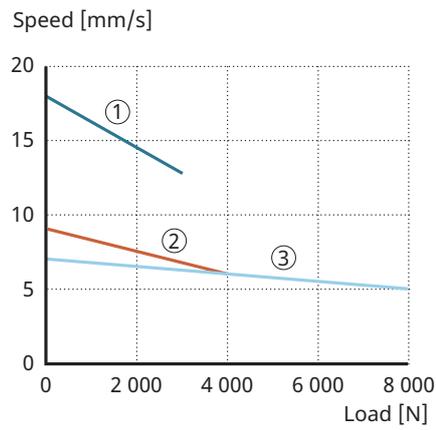
18 Rear mounting



001C106D

3.1.3 Speed and load

19 Speed-load diagram

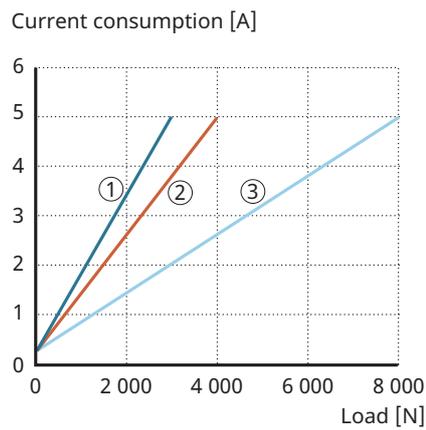


001C123D

1	Rated compression force 3000 N	2	Rated compression force 4000 N
3	Rated compression force 8000 N		

3.1.4 Current and load

20 Current-load diagram

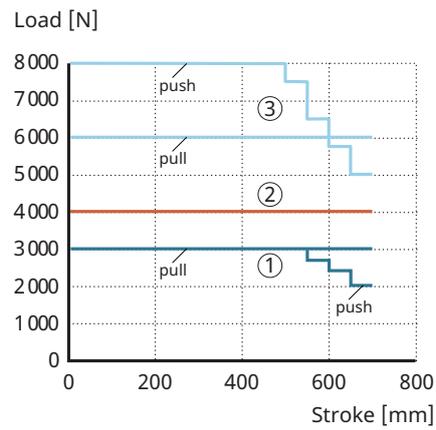


001C124D

1	Rated compression force 3000 N	2	Rated compression force 4000 N
3	Rated compression force 8000 N		

3.1.5 Safety factor load conditions

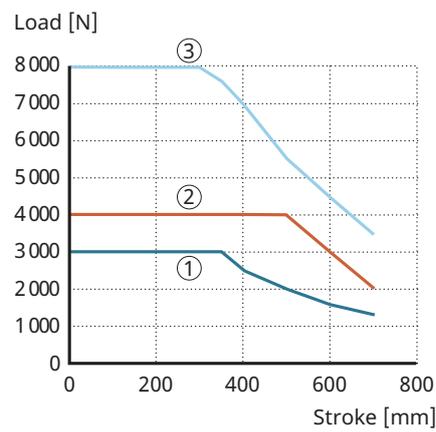
21 Push load reduction, static safety factor $S = 1$



001C125D

1	Rated compression force 3000 N	2	Rated compression force 4000 N
3	Rated compression force 8000 N		

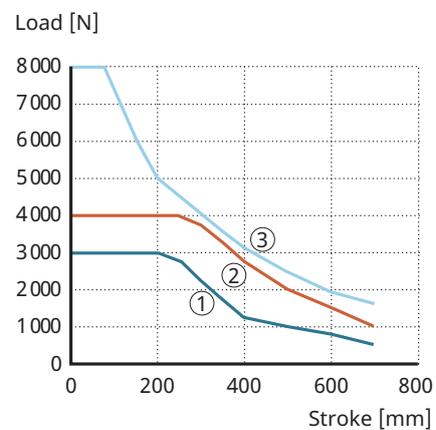
22 Push load reduction, static safety factor $S = 2$



001C126D

1	Rated compression force 3000 N	2	Rated compression force 4000 N
3	Rated compression force 8000 N		

23 Push load reduction, static safety factor $S = 4$ (EN 60601)



001C127D

1	Rated compression force 3000 N	2	Rated compression force 4000 N
3	Rated compression force 8000 N		

3.2 Control unit

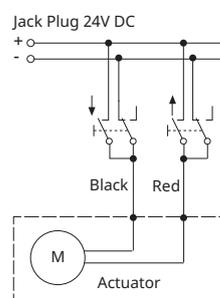
3.2.1 Control units and accessories

4 Operating elements and control units

Operating elements	Control unit			
	SCU	VCU	BCU	MCU
EHA 1	-	-	-	Hand switch
EHA 3	Hand switch	Hand switch	Hand switch	-
STJ	Foot switch	Foot switch	Foot switch	-
STF	-	-	-	Foot switch
STE	Desk switch	Desk switch	Desk switch	-
STA	-	-	-	Desk switch

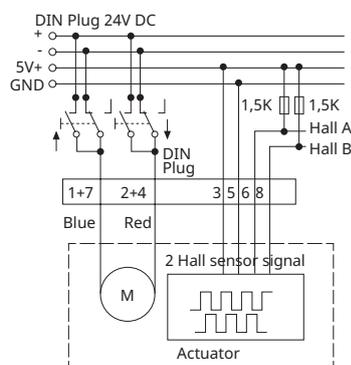
3.2.2 Connection

24 Connection diagram 1



001C102D

25 Connection diagram 2



001C103D

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

4 Matrix - MAX7

27 Linear drive MAX7



001C129B

4.1 Performance overview

4.1.1 Technical data

5 Technical data

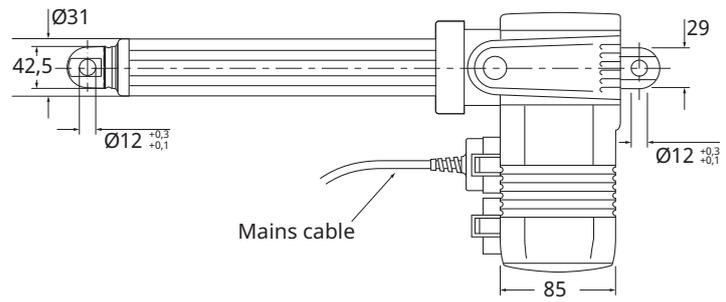
Feature	Unit	MAX7..A..	MAX7..B..	MAX7..C..
Rated push load	N	8000	4000	3000
Rated pull load	N	6000 ¹⁾	4000	3000
min. speed (full load)	mm/s	6	8	13
max. speed (no load)	mm/s	7.5	10	18
min. stroke	mm	50	50	50
min./max. stroke	mm	700	700	700
Retracted length	mm	Stroke + 215/280 ²⁾	Stroke + 215/280 ²⁾	Stroke + 215/280 ²⁾
Voltage	VAC	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
Degree of protection	IP	66S	66S	66S
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 strokes ≤ 350 mm: L = 215 + stroke
For strokes > 350 mm: L = 280 + stroke

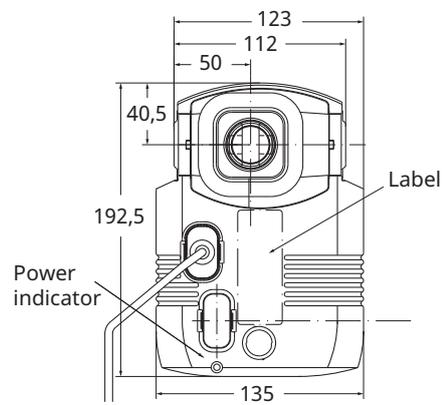
4.1.2 Geometric data

28 Side view



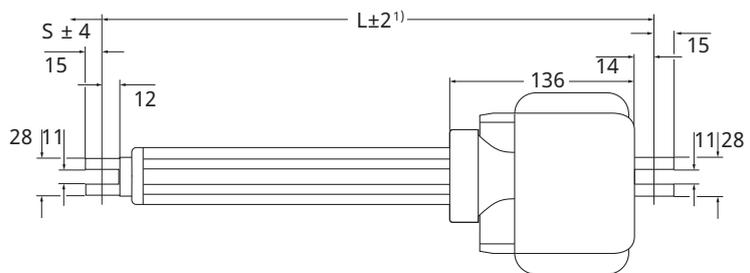
001C130E

29 Front view



001C12FE

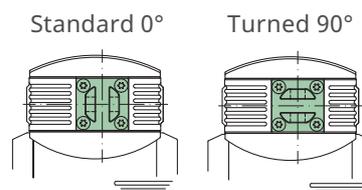
30 Top view



001C12CD

- 1) For strokes ≤ 350 mm: $L = 215 + \text{stroke}$
 For strokes > 350 mm: $L = 280 + \text{stroke}$

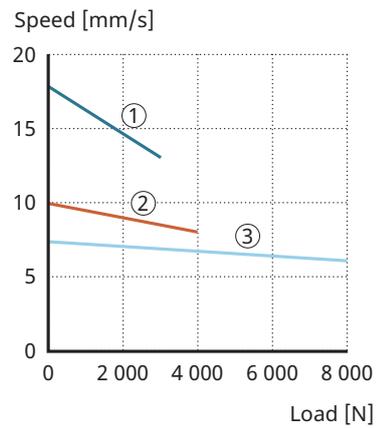
31 Rear mounting



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4.1.3 Speed and load

32 Speed-load diagram

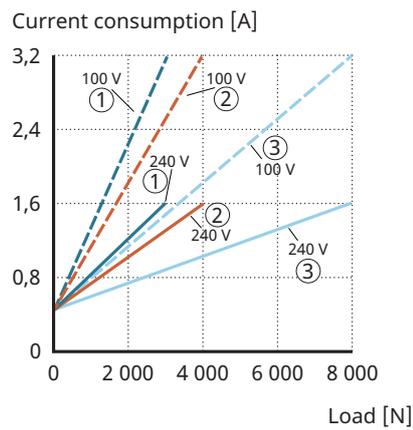


001C137E

1	Rated compression force 3000 N	2	Rated compression force 4000 N
3	Rated compression force 8000 N		

4.1.4 Current and load

33 Current-load diagram

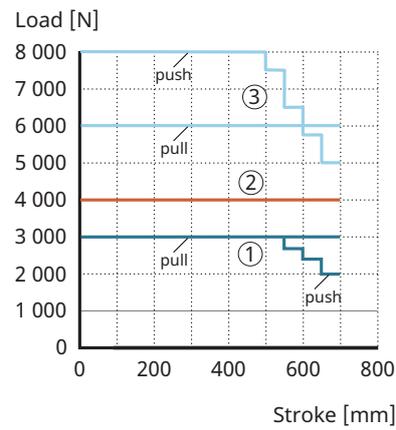


001C138E

1	Rated compression force 3000 N	2	Rated compression force 4000 N
3	Rated compression force 8000 N		

4.1.5 Safety factor load conditions

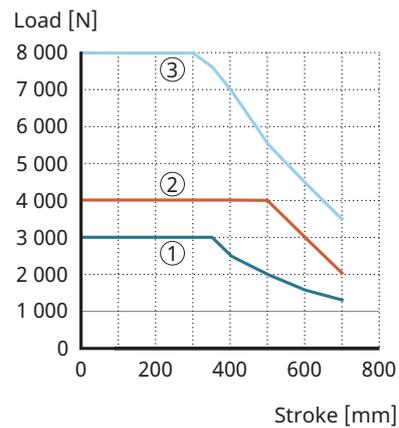
34 Push load reduction, static safety factor $S = 1$



001C139E

1	Rated compression force 3000 N	2	Rated compression force 4000 N
3	Rated compression force 8000 N		

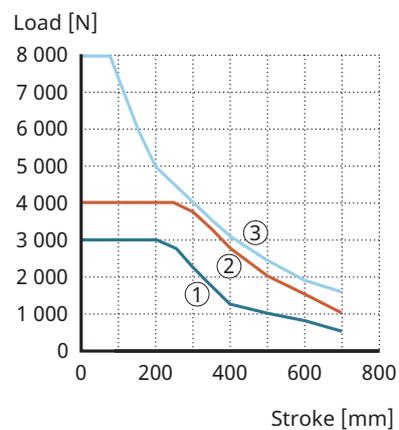
35 Push load reduction, static safety factor $S = 2$



001C13AE

1	Rated compression force 3000 N	2	Rated compression force 4000 N
3	Rated compression force 8000 N		

36 Push load reduction, static safety factor $S = 4$ (EN 60601)



001C13BE

1	Rated compression force 1500 N	2	Rated compression force 2000 N
3	Rated compression force 4000 N		

4.2 Control unit

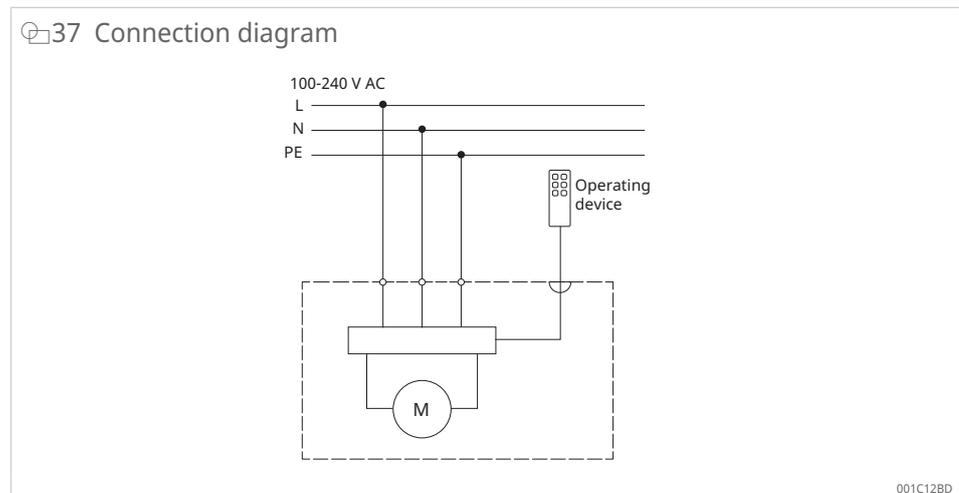
4.2.1 Control units and accessories

6 Operating elements and control units

Operating elements	MAX70	MAX72/74
EHA 1	-	Hand switch
PHC	Hand switch	-
STF	-	Foot switch
PFP	Foot switch	-
STA	-	Desk switch
PAM	Desk switch	-

4.2.2 Connection

37 Connection diagram



4.4 Accessories

7 Accessories

	Plug type	Country	Designation	Ordering number
Straight cable, 3.5 m long	Schuko	DE	ZKA-140306-3500	0121723
Straight cable, 3.5 m long	SEV	CH	ZKA-140316-3500	0121737
Straight cable, 3.5 m long	UL	USA	ZKA-140355-3500	0121724
Straight cable, 3.5 m long	Hospital grade	USA	ZKA-140360-3500	0121732
Straight cable, 3.5 m long	British Standard	UK	ZKA-140350-3500	0121743
Coiled cable, 1.2 m / 2.2 m / 2.2 m	Schuko	DE	ZKA-140342-1500	0121728
Strain relief for mains cable	-	-	ZUB-952253	0102848
Tool for plug (socket/D-sub/mains connection cable)	-	-	ZBG-140375	0125322

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