

# Linear actuator Matrix series





# Matrix series

The Matrix series is designed for medical devices and includes powerful AC and DC linear actuators using DC motor.

They run very quietly, take up little space and can be installed at virtually every angle in vertical or horizontal position. The series is medical approved by third parties and available with options like anti-pitching, incremental position feedback and emergency lowering. The Matrix series can be supplied as a full system with controls, operating units and accessories.



## Features

- Designed for medical devices
- Full system with controls, operating units and accessories
- Back up nut as standard
- Safety factor up to 4

## Benefits

- Synchronization possible
- Silent operation
- Compact and aesthetic
- Back-up nut as standard

# Matrix1

## Linear actuator



### Benefits

- Silent operation
- Full system with control unit, switch and accessories
- Synchronization possible
- Compact and aesthetic
- Back-up nut as standard

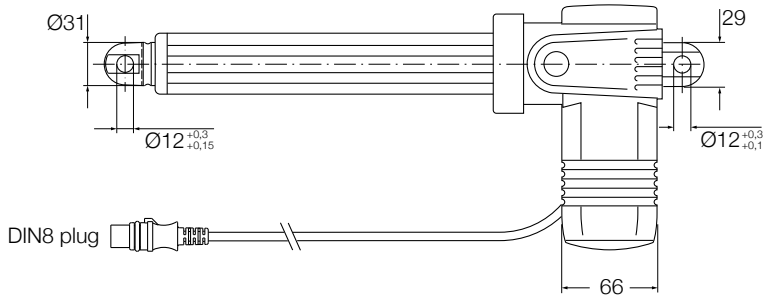
### Technical data

	Unit	MAX1..A..	MAX1..B..	MAX1..C..
Rated push load	N	4 000	2 000	1 500
Rated pull load	N	4 000	2 000	1 500
Speed (full load to no load)	mm/s	5 to 7	6 to 9	13 to 18
Stroke	mm	50 to 700	50 to 700	50 to 700
Retracted length	mm	S + 195/260 <sup>1)</sup>	S + 195/260 <sup>1)</sup>	S + 195/260 <sup>1)</sup>
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)
Ambient temperature	°C	0 to +40	0 to +40	0 to +40
Type of protection	IP	66S	66S	66S
Weight (at 200 mm stroke)	kg	4	3,7	3,6
Color	–	Grey	Grey	Grey

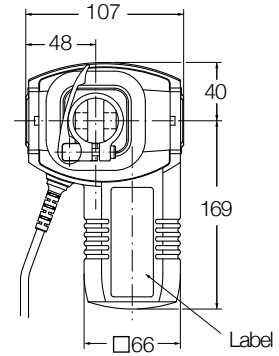
<sup>1)</sup> S < 350 mm, L = 195 + S  
S > 350 mm, L = 260 + S

### Dimensional drawing

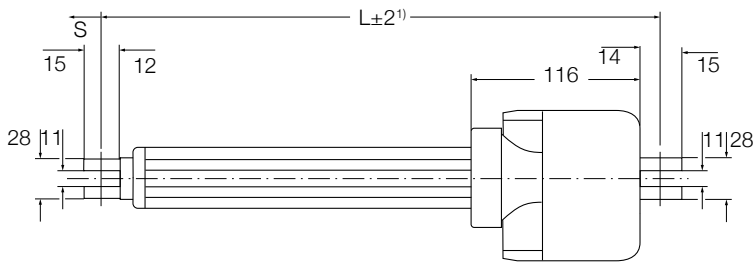
#### Side view



#### Front view

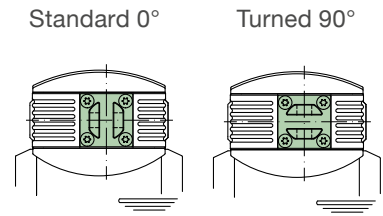


#### Top view

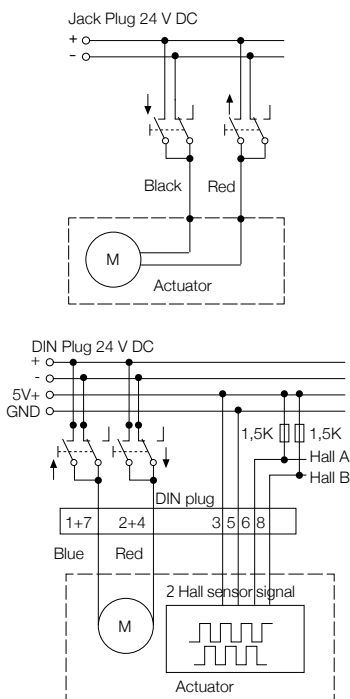


<sup>1)</sup> S < 350 mm; L = 195 + S  
 S > 350 mm; L = 260 + S

#### Rear view



### Connecting diagrams



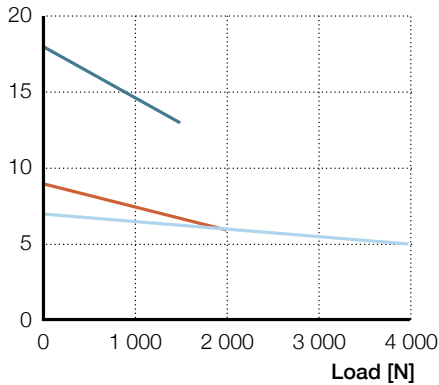
### Suitable control units and accessories

	Control units			
	SCU	VCU	BCU	MCU
<b>MAX 1</b>	•	•	•	•
<b>Operating switches</b>				
EHA 1	Hand switch			•
EHA 3	Hand switch			•
STJ	Foot switch			•
STF	Foot switch			•
STE	Desk switch			•
STA	Desk switch			•

### Performance diagrams

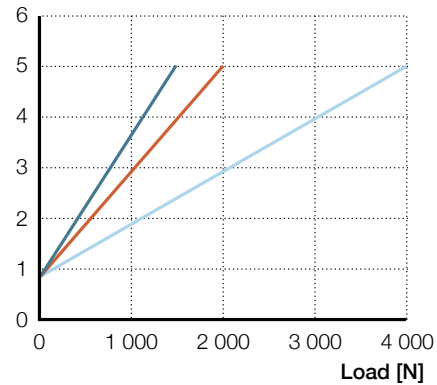
Speed-load diagram

Speed [mm/s]



Current-load diagram

Current consumption [A]



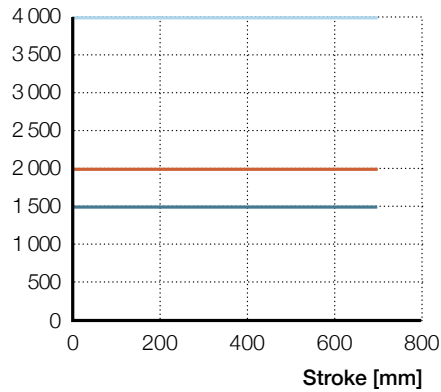
— Rated push force 1 500

— Rated push force 2 000

— Rated push force 4 000

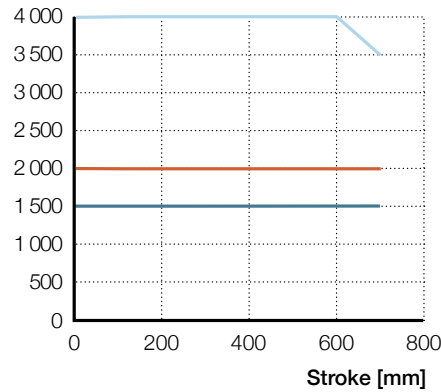
### Safety factor load conditions

Load [N]



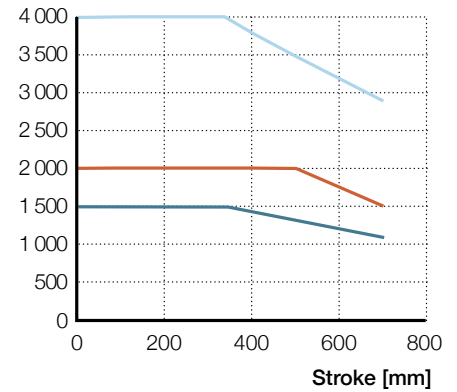
Push load reduction static  
Safety factor S=1

Load [N]



Push load reduction static  
Safety factor S=2

Load [N]



Push load reduction static  
Safety factor S=4 (EN60601)

— Rated push force 1 500

— Rated push force 2 000

— Rated push force 4 000

**Ordering key**



**Type**

**Voltage**

- 0 24 V 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)<sup>1)</sup>
- F Quick-release +EKZm, push, fork head bore 90° to button (for actuator design "C" is L= +115 mm)<sup>1)</sup>
- I Mechanical anti-pinching, motor direction pull, no fixing in term. position (for load "A", L= +45 mm; "B"and "C", L= +30 mm)
- J Mechanical anti-pinching, motor direction push, no fixing in term. position (for load "A", L= +45 mm; "B"and "C", L= +30 mm)
- 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
- M Lifetime monitoring
- P Lifetime monitoring, 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**

<sup>1)</sup> EKZm: mechanical anti-pinching min. stroke 150 mm up to 300 mm

Options shown in red are only available on request. Contact Ewellix for more information on minimum quantities and additional costs.

# Matrix3

## Linear actuator



### Benefits

- Silent operation
- Full system with control unit, switch and accessories
- Synchronization possible
- Compact and aesthetic
- Back-up nut as standard

### Technical data

	Unit	MAX3..A..	MAX3..B..	MAX3..C..
Rated push load	N	8 000	4 000	3 000
Rated pull load	N	6 000 <sup>1)</sup>	4 000	3 000
Speed (full load to no load)	mm/s	5 to 7	6 to 9	13 to 18
Stroke	mm	50 to 700	50 to 700	50 to 700
Retracted length	mm	S + 215/280 <sup>2)</sup>	S + 215/280 <sup>2)</sup>	S + 215/280 <sup>2)</sup>
Voltage	V DC	12 or 24	12 or 24	12 or 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)
Ambient temperature	°C	0 to +40	0 to +40	0 to +40
Type of protection	IP	66S	66S	66S
Weight (at 200 mm stroke)	kg	4,5	4,2	4
Color	–	Grey	Grey	Grey

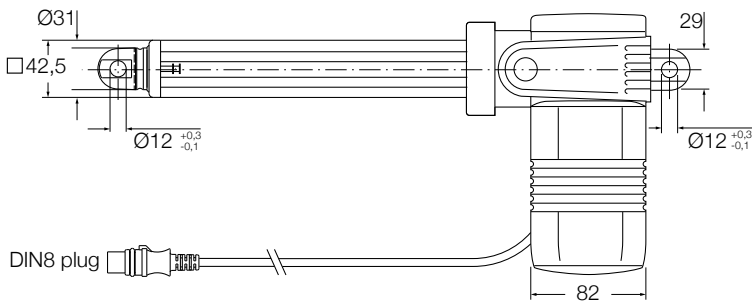
<sup>1)</sup> Max load for medical application is 5 000 N

<sup>2)</sup> S ≤ 350 mm; L = S + 215  
S > 350 mm; L = S + 280

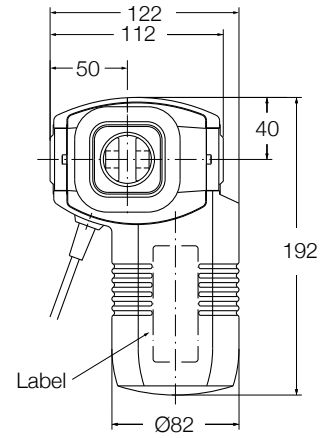


## Dimensional drawing

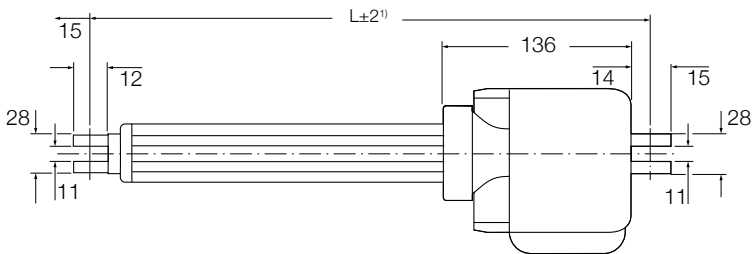
### Side view



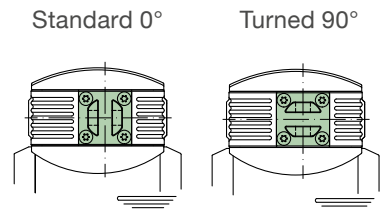
### Front view



### Top view

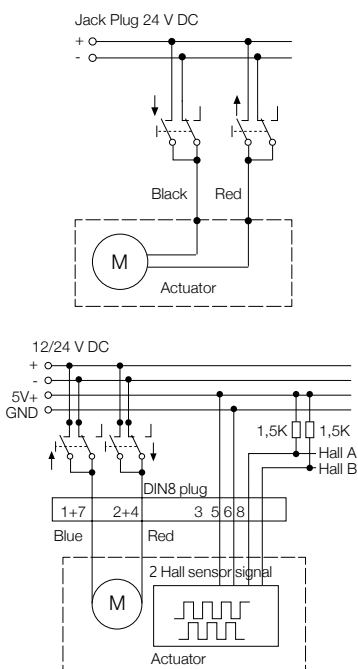


### Rear view












¹) S < 350 mm; L = 215 + S  
S > 350 mm; L = 280 + S

## Connecting diagrams



## Suitable control units and accessories

	Control units			
	SCU	VCU	BCU	MCU
<b>MAX 3</b>	•	•	•	•
<b>Operating switches</b>				
EHA 1 				•
EHA 3 	•	•	•	
STJ 	•	•	•	
STF 				•
STE 	•	•	•	
STA 				•

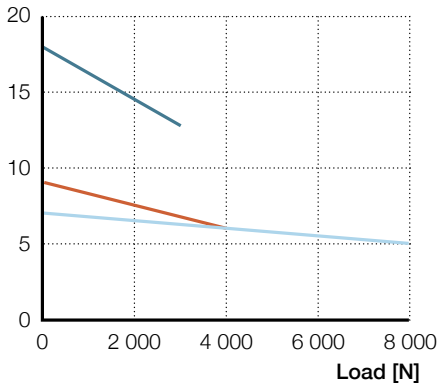
 Hand switch    
  Foot switch    
  Desk switch

¹) Only valid for MAX 31. MAX 30 must be operated by a BCU, MCU, SCU or VCU control unit.

### Performance diagrams

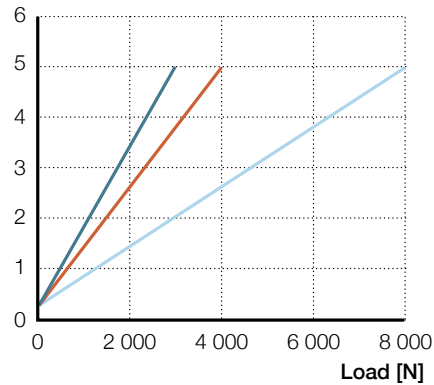
Speed-load diagram

Speed [mm/s]



Current-load diagram

Current consumption [A]



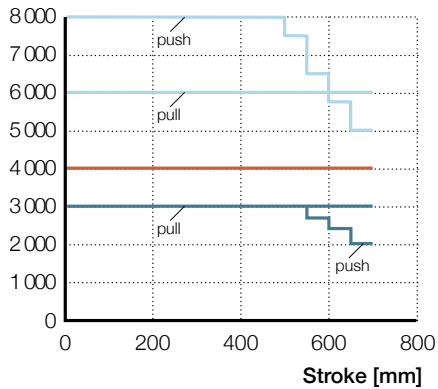
— Rated push force 3 000

— Rated push force 4 000

— Rated push force 8 000

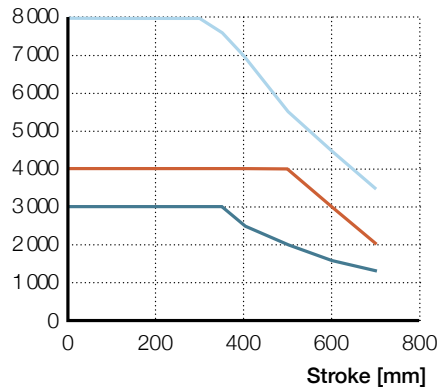
### Safety factor load conditions

Load [N]



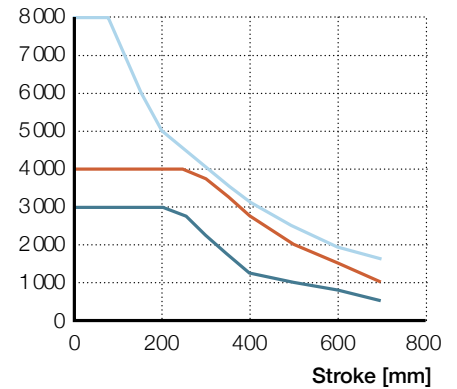
Push load reduction static  
Safety factor S=1

Load [N]



Push load reduction static  
Safety factor S=2

Load [N]



Push load reduction static  
Safety factor S=4 (EN60601)

— Rated push force 3 000

— Rated push force 4 000

— Rated push force 8 000

# Ordering key



## Type

### Voltage

- 0 24 V DC
- 1 **24 V DC with integrated current cut-off**
- 2 **12 V DC**

### Load

- A 8 000 N
- B 4 000 N
- C 3 000 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

### 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)<sup>1)</sup>
- F **Quick-release +EKZm, push, fork head bore 90° to button (for actuator design "C" is L= +115 mm)<sup>1)</sup>**
- I Mechanical anti-pinching, motor direction pull, no fixing in term. position (for load "A", L= +45 mm; "B"and "C", L= +30 mm)
- J Mechanical anti-pinching, motor direction push, no fixing in term. position (for load "A", L= +45 mm; "B"and "C", L= +30 mm)
- K Electrical anti-pinching protection, motor direction pull
- L Electrical anti-pinching protection, motor direction push
- 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
- M **Lifetime monitoring**
- P **Lifetime monitoring, 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

<sup>1)</sup> EKZm: mechanical anti-pinching min. stroke 150 mm up to 300 mm

Options shown in red are only available on request. Contact Ewellix for more information on minimum quantities and additional costs.

# Matrix7

## Linear actuator



### Benefits

- Universal power supply
- Power indicator
- Plug and play with integrated control unit
- Designed for medical devices, compliant to IEC 60601-1

### Technical data

	Unit	MAX7..A..	MAX7..B..	MAX7..C..
Rated push load	N	8 000	4 000	3 000
Rated pull load	N	6 000 <sup>1)</sup>	4 000	3 000
Speed (full load to no load)	mm/s	6 to 7,5	8 to 10	13 to 18
Stroke	mm	50 to 700	50 to 700	50 to 700
Retracted length	mm	S + 215/280 <sup>2)</sup>	S + 215/280 <sup>2)</sup>	S + 215/280 <sup>2)</sup>
Voltage	V	100-240 AC 50/60 Hz	100-240 AC 50/60 Hz	100-240 AC 50/60 Hz
Power consumption	W	180	180	180
Current consumption	100 V AC	A	3,2	3,2
	240 V AC	A	1,6	1,6
Duty cycle	%	10 (1/9)	10 (1/9)	10 (1/9)
Ambient temperature	°C	0 to +40	0 to +40	0 to +40
Type of protection	IP	66S	66S	66S
Weight (at 200 mm stroke)	kg	4,8	4,5	4,2
Color	–	Grey	Grey	Grey

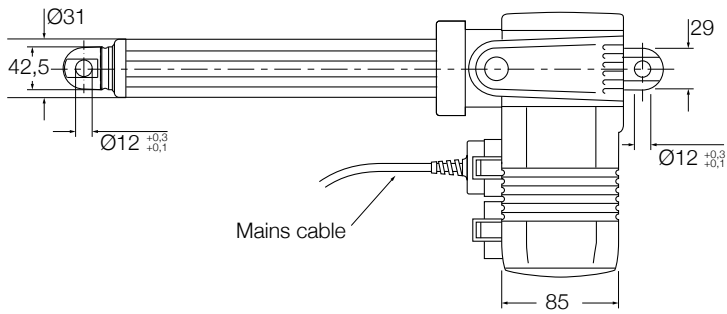
<sup>1)</sup> Max load for medical application is 5 000 N

<sup>2)</sup> S < 350 mm; L = S + 215

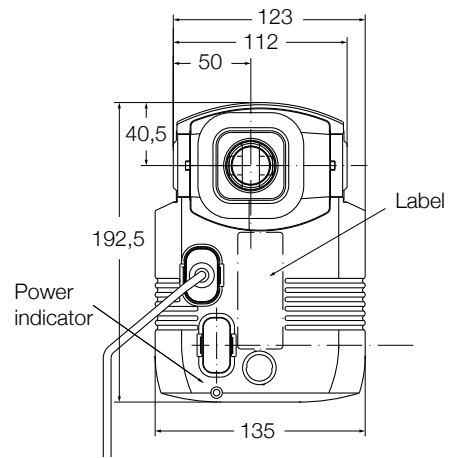
S > 350 mm; L = S + 280

## Dimensional drawing

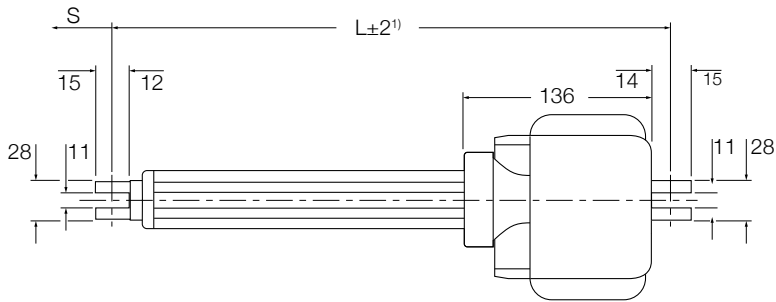
### Side view



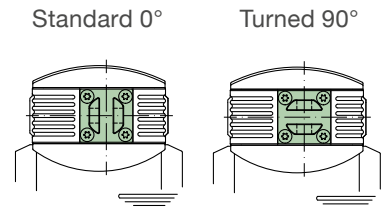
### Front view



### Top view

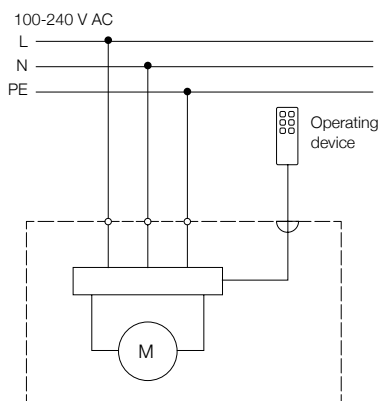


### Rear view












¹¹ S < 350 mm; L = 215 + S  
S > 350 mm; L = 280 + S

## Connecting diagrams



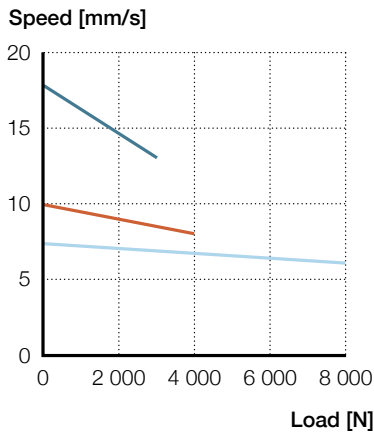
## Suitable operating switches

	Operating switches					
	 EHA1	 PHC	 STF	 PFP	 STA	 PAM
MAX70		•		•		•
MAX72/74	•		•		•	

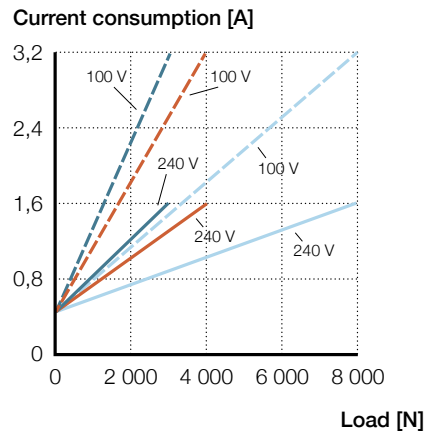
 Hand switch     
  Foot switch     
  Desk switch

## Performance diagrams

Speed-load diagram

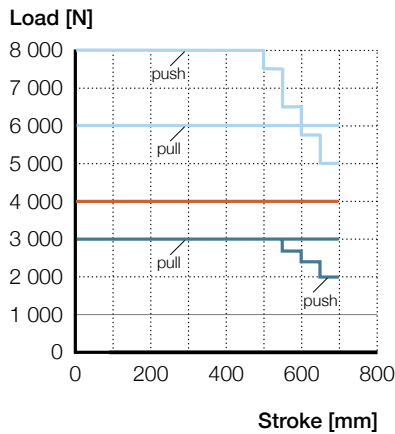


Current-load diagram

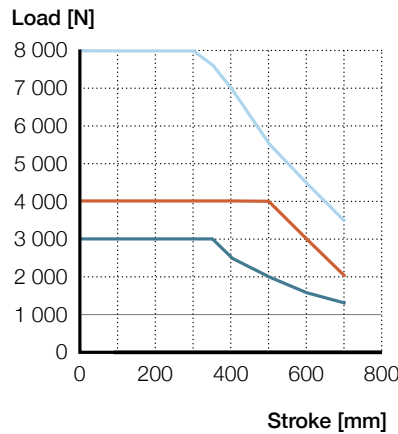


— Rated push force 3 000      — Rated push force 4 000      — Rated push force 8 000

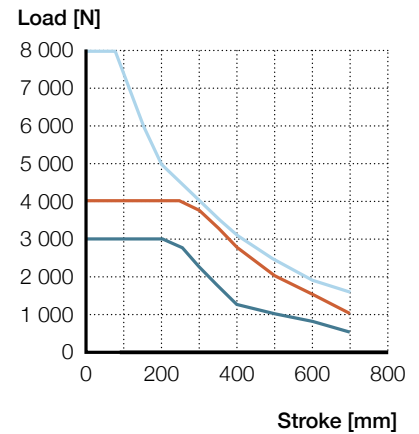
## Safety factor load conditions



Push load reduction static  
Safety factor S=1



Push load reduction static  
Safety factor S=2



Push load reduction static  
Safety factor S=4 (EN60601)

— Rated push force 3 000      — Rated push force 4 000      — Rated push force 8 000

## Accessories

	Plug	Country	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	USA	ZKA-140360-3500	0121732
Straight cable 3,5 m	British standard	UK	ZKA-140350-3500	0121743
Coiled cable 1,2 m / 2,2 m	Schuko	DE	ZKA-140342-1500	0121728
Coiled cable 1,2 m / 2,2 m	SEV	CH	ZKA-140378-1200	0121738
Straight polyurethane cable 3,5 m	Schuko	DE	ZKA-140422-3500	0121739
Straight polyurethane cable 3,5 m	SEV	CH	ZKA-140426-3500	0121740
Strain relief for mains cable			ZUB-952253	0102848
Tool for plugs (Jack/D-Sub/Mains)			ZWS-140375	0125322

**Ordering key**



**Type**

**Voltage**

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

**Load**

- A 8 000 N
- B 4 000 N
- C 3 000 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

**Cable / Connecting plug**

- 0 No cable

**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)<sup>1)</sup>
- F Quick-release +EKZm, push, fork head bore 90° to button (for actuator design "C" is L= +115 mm)<sup>1)</sup>
- I Mechanical anti-pinching, motor direction pull, no fixing in term. position (for load "A", L= +45 mm; "B"and "C", L= +30 mm)
- J Mechanical anti-pinching, motor direction push, no fixing in term. position (for load "A", L= +45 mm; "B"and "C", L= +30 mm)
- K Electrical anti-pinching protection, motor direction pull
- L Electrical anti-pinching protection, motor direction push
- M Push load, for actuator version "B" and "C"
- N Pull load, for actuator version "B" and "C"

**Option 2**

- 0 No option

**Option 3**

- 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**

<sup>1)</sup> EKZm: mechanical anti-pinching min. stroke 150 mm up to 300 mm

Options shown in red are only available on request. Contact Ewellix for more information on minimum quantities and additional costs.



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