Operating Manual

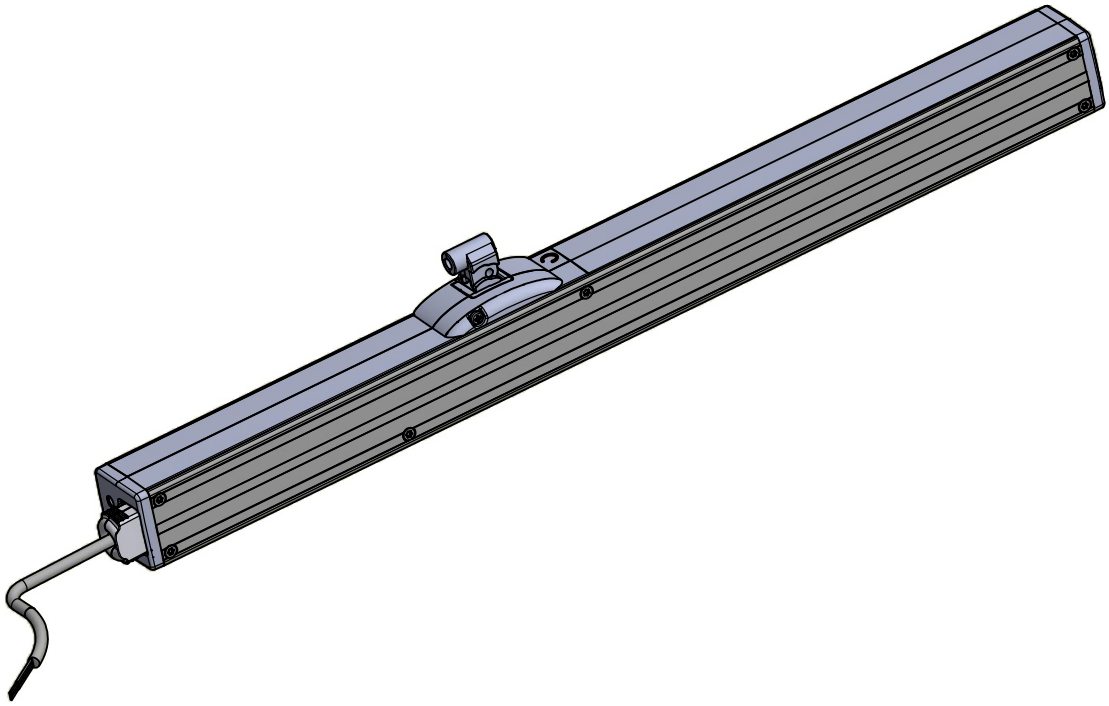
Chain Actuator – EA-K-30/xxx-T(-DA)

SIMON RWA®
Begeisterung trifft Technik

BA EA-K-30/xxx-T(-DA) EN 1.0

Only valid for the following article numbers:

- M2 5315 (DA) 400 mm stroke
- M2 5316 (DA) 600 mm stroke
- M2 5317 (DA) 800 mm stroke
- M2 5318 (DA) 1.000 mm stroke



exemplary picture!

Only valid in combination with the attached sheet “safety instructions and terms of guarantee”!

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Preface

1. Preface

1.1 Foreword to this manual

This manual has been created for the purposes of proper operation, installation and maintenance by trained, experienced specialist personnel (e. g. mechatronics engineer or electrician) and / or specialist personnel with knowledge involving the installation of electrical devices.

Read the operating manual carefully and follow the prescribed sequence. Retain the operating manual for later use / maintenance. Please precisely observe the pin assignment, the minimum and maximum performance data (see “Technical data”) and the installation instructions. Incorrect usage or improper operation / assembly can cause the loss of system functions and result in damage to property and / or persons.

You will find the following symbols in this manual:

INFORMATION

This information provides you with additional tips!

ATTENTION

This warning draws your attention to potential dangers for the product!

DANGER

This warning draws your attention to possible risks to your life or health!

ENVIRONMENTAL NOTE

This warning draws your attention to potential dangers for the environment!

➢ This is how operating procedures are identified.

➘ Consequences are represented this way.

- *Buttons* or *switches* to be activated are indicated in italics.
- “Displays” are placed in quotation marks.

1.2 Use for the intended purpose

Openers (actuators) serve for the opening of building coverings, which can be installed in walls or in roofs and used for the ventilation of rooms or for the exhaust of smoke. The opening actuator may have to be extended by protective measures in accordance with the risk assessment which is to be carried out.

1.3 Product description

The opening actuator is suitable for mounting on building coverings (e.g. windows). They are usable with SHEV and / or ventilation controllers from SIMON RWA-Systeme GmbH. The opening actuator is suitable for installation and use in smoke exhaust systems.

1.4 Functional description

The latest innovation from the house of Simon RWA-Systeme GmbH is distinguished not only by its aesthetic surface design but above all by its excellent technical characteristics and its all-encompassing bracket range.

The distinguished technical features are:

- soft start
- compact dimensions
- low power consumption
- extreme smoothness
- low noise level
- soft-close range (75 mm before reaching the end position “CLOSE”) with lower cut-off current
- electronic zero point reset within the first 30 mm of stroke in ‘CLOSING’ direction
- stroke parametrisable via SIMON-Link (beginning with 100 mm stroke) without any additional external power supply!)

SIMON LINK®

- At both ends (EA-K-30/xxx-T-DA) connection option for the connecting cable (with plug connector)
- DUO-operation of two actuators[1] by a connecting cable, the power supply is fed through from one actuator to another actuator

1. At least one actuator (EA-K-30/xxx-DA) with double connection required.

Preface

1.5 Technical data

Table 1: Electrical characteristics

Actuator type/version	EA-K-30
Rated voltage:	24 V DC
Permissible rated voltage range:	24 V DC -15%; +15%
Ripple of rated voltage:	max. 500 mV
Undervoltage detection:	yes
Rated current[1]:	1.0 A
Maximum starting current:	1.1 A
Maximum cut-off current in 'OPENING' and 'CLOSING' direction[2]:	1.1 A
Soft-close current[3]:	0.3 A
Current consumption after cut-off (closed current):	40 mA
Cut-off via:	built-in electronic overload cut-off
Maximum permissible number of actuator units connected in parallel[4]:	2
Cable length between two actuators in tandem mode:	max. 10 m
Stopping time[5]:	3 s
Pulse time[6]:	300 ms
Protection class:	III

1. Maximum current consumption with nominal load.
2. Parametrisable via SIMON-Link.
3. Soft-close range: last 75 mm before reaching the end position "CLOSE", soft-close current parametrisable via SIMON-Link – current range: 0.3 A – 1.0 A. If the speed reduction is active 0.3 A – 0.5 A.
4. With common cut-off function (tandem function).
5. The stopping time indicates how long the actuators connected in parallel remain powered after the trigger actuator is shut down. Each 50 mm before reaching the end position, the delay time is 3 s, in the range between 0 s (see Figure 20: "Parametrisation ranges" on page 15).
6. The pulse time indicates how long the internal or external overload cut-off provides the cut-off signal at the output.

Table 2: Volt-free contact (NO1, NO2)

Actuator type/version	EA-K-30
Rated voltage:	max. 28 V DC
Relay contact load:	1.0 A

The normally open contact (NO) is only switched when the actuator is cut off in the 'CLOSED' end position. This means that the signal is stroke-dependent and can be evaluated as a 'CLOSED signal'. An activation of the switch in 'OPENING' end position is also adjustable via SIMON link and other settings.

ATTENTION

The maximum contact load (see Table 2: "Volt-free contact (NO1, NO2)") must not be exceeded.

INFORMATION

The output of the volt-free contact is only possible on the gear box side of the actuator (see Figure 2: "Chain actuator" on page 6)!

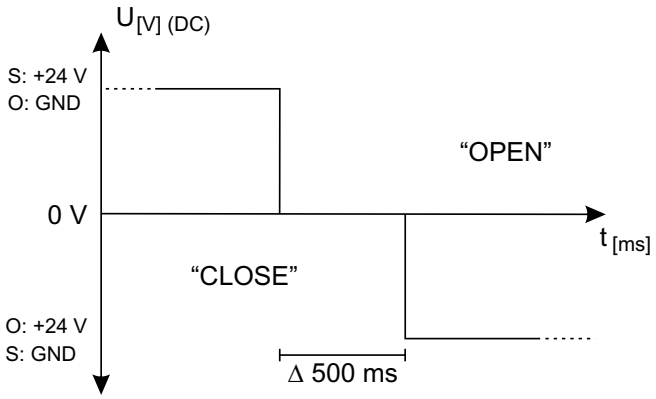
Table 3: Connection and operation

Actuator type/version	EA-K-30
Silicone connection cable with plug connector:	5 x 0.75 mm²
Connection cable length[1]:	3 m
Pause when changing direction[2]:	min. 500 ms
Switch-on duration:	ED 30%
Stability of opening and closing cycles:	11000
Sound level[3]:	≤ 55 dB (A)
Multiple triggering as per prEN 12101-9:	allowed
Multiple triggering after stop:	allowed
Maintenance:	See additional sheet "Safety instructions and terms of guarantee"!

1. Optional lengths possible.
2. It is important that we have a zero-voltage part of 500 ms (see Figure 1: "Zero-Voltage part by direction change" on page 5).
3. Measured at a distance of one metre under normal conditions.

Preface

Figure 1: Zero-Voltage part by direction change



ATTENTION

Voltage stability / quality: Allowed are only clear power downs (voltage drop from 24 V (DC) to 0 V in less than 10 ms).
Especially for transition from primary power supply (main operation) to secondary power supply (backup power supply).

Table 4: Installation and environmental conditions

Actuator type/version	EA-K-30
Rated operating temperature:	20 °C
Permissible ambient temperature range:	-5 to 75 °C
Temperature stability (NSHEV):	300 °C
Ingress protection:	IP 32
Usage range:	Central European environmental conditions ≤ 2000 metres above sea level

Table 5: Approvals and certificates

Actuator type/version	EA-K-30
CE-compliant:	in accordance with EMC directive 2014/30/EU and the low-voltage directive 2014/35/EU
Further approvals:	on request

Table 6: Mechanical characteristics

Actuator type/version	EA-K-30
Maximum pushing force[1]:	300 N
Maximum tractive force[2]:	300 N
Condition of loading:	Opening against nominal load / Closing with nominal load support
Nominal locking force:	1000 N
Nominal stroke[3] – EA-K-30/400-T(-DA): – EA-K-30/600-T(-DA): – EA-K-30/800-T(-DA): – EA-K-30/1000-T(-DA):	 400 mm 600 mm 800 mm 1000 mm
Stroke speed with nominal load[4] – 300 N: – 200 N: – 100 N:	 9.7 mm/s 11.1 mm/s 12.5 mm/s
Material surface:	Alu E6/EV1 Finishing[5] in any standard RAL and DB colour available on request
Material chain:	corrosion-resistant monostable steel chain, silver plated (An optional stainless steel chain is possible)
Dimensions (L x H[6] x W) – EA-K-30/400-T(-DA): – EA-K-30/600-T(-DA): – EA-K-30/800-T(-DA): – EA-K-30/1000-T(-DA):	 467 x 37 x 35 mm 564 x 37 x 35 mm 667 x 37 x 35 mm 764 x 37 x 35 mm
Weight[7] – EA-K-30/400-T(-DA): – EA-K-30/600-T(-DA): – EA-K-30/800-T(-DA): – EA-K-30/1000-T(-DA):	 1.30 kg 1.52 kg 1.80 kg 2.02 kg

1. Only possible under optimal conditions up to 600 mm stroke (see chapter 4.1.8 "Permitted push force to the chain" on page 12). Pushing force via SIMON link parametrisable.
2. Tractive force via SIMON link parametrisable.
3. When the chain is stretched, e.g. traction relief. The nominal stroke can deviate to max. ± 3% by mechanical damping and tolerances, but not more than 20 mm.
4. In relation to a stroke of 600 mm; tolerance ± 5%.
5. Attention: nuts, bolts, washers, sliders and similar individual parts are not coated.
6. Plus the amount of the chain exit (7 mm).
7. Specifications without connecting cable and brackets.

Table 7: Accessories

Actuator type/version	EA-K-30
Mechanical connection to the actuating element (chain):	A wide selection of bracket sets is available. The technical data apply only in conjunction with original accessories!
Mechanical connection to the actuator housing:	

Safety regulations

2. Safety regulations

See additional sheet “Safety instructions and terms of guarantee”!

3. Figures

Figure 2: Chain actuator

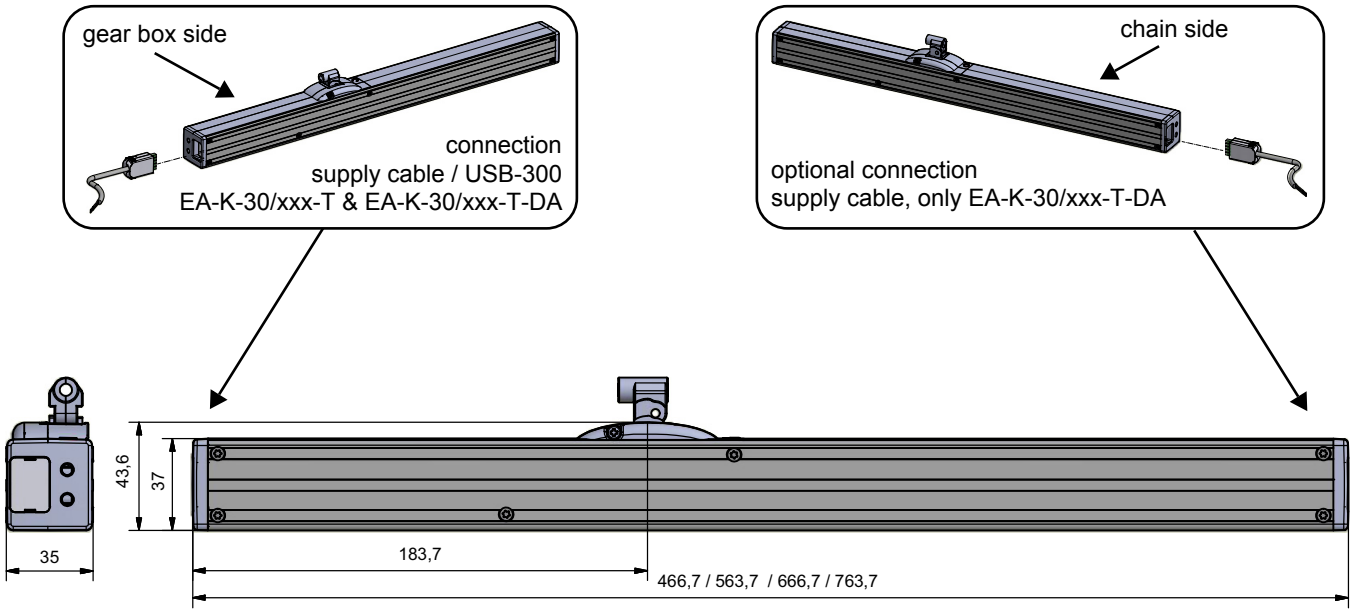


Figure 3: Top bracket K-K50-OK (K2 5089)

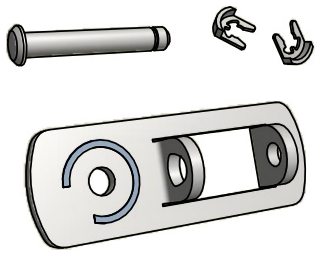


Figure 4: Side bracket K-K30-A (K2 5097)

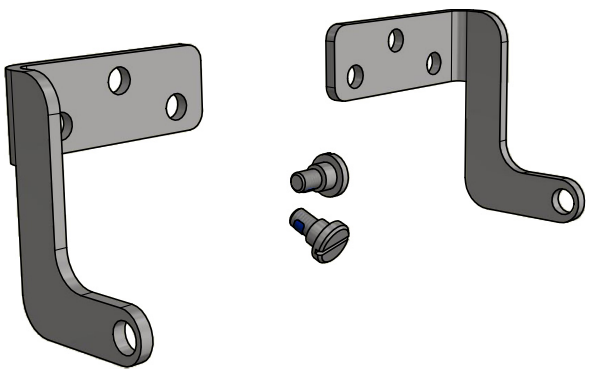


Figure 5: Side bracket K-K30-K (K2 5098)

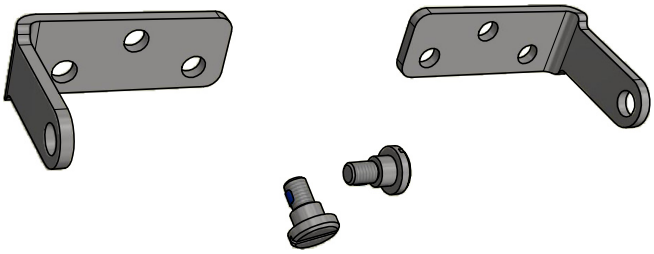
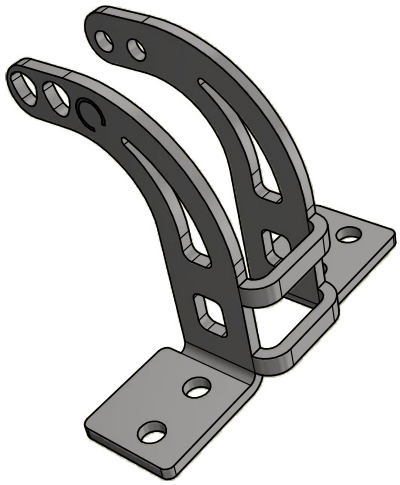


Figure 6: Inward opening top bracket K-K30-AKI (K2 5105)



4. Mounting

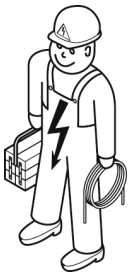
See additional sheet “Safety instructions and terms of guarantee”!

INFORMATION

Further information can be found in the ZVEI data sheet ‘Force operated windows’ (www.simon-rwa.com).

DANGER

Mounting shall be carried out only by professional personnel (electrically skilled person)! All relevant national safety regulations and rules apply to mounting, installation and commissioning.
If the installation is not carried out correctly there is a danger of electrocution. It is essential that you adhere to the applicable safety regulations! Pay attention to the valid installation regulations. Incorrect installation can lead to serious injuries.



4.1 Mechanical connection

Depending on the mounting position and shape of the window or buildings cover you need different combinations of mounting brackets, except the top bracket K-K50-OK. The brackets (see page 6), must be ordered separately.

ATTENTION

Consider the static properties of the frame for the installation of the actuator.
Use appropriate fastenings depending on the material of the window onto which the actuator is mounted.
Fastenings are not included!

- To achieve a good sealing of buildings cover check before fitting the actuator that the chain is extended a small piece after mounting, but after installation no more than 30 mm. Otherwise the electronic zero-reset does not work anymore (see Figure 20: “Parametrisation ranges” on page 15).

4.1.1 Mounting the brackets

- Specify the mounting position of the brackets firmly so that the actuator chain passes the (window / wing) frame in each opening position of the flap and that the mounting position of the chain is in the middle of the frame. Therefore there are check marks provided on the K-K-50-OK (see Figure 9 on page 8). In parallel operation / duo operation the actuators should be positioned so that the chains are on 1/4 distance from the edges (left / right) of the window sash.
- Mount the brackets with screws (suitable for the respective window or subsurface, screws **not** included), see figures on page 10 and page 11.
- Insert the actuator into the mounting brackets (K-K30-K or K-K30-A) and fix them with the two self-locking screws.

Figure 7: K-K30-K

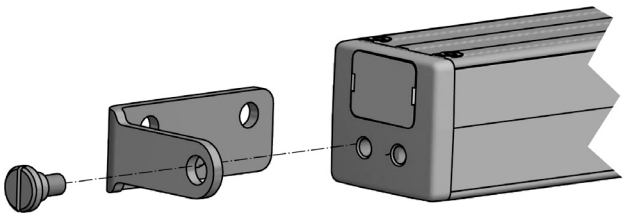
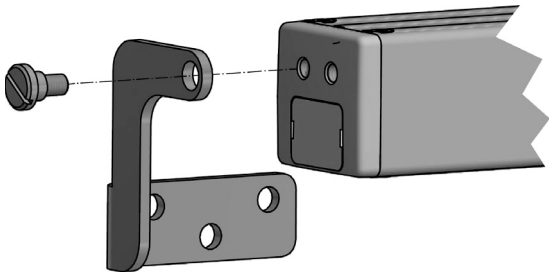


Figure 8: K-K30-A



Mounting

4.1.2 Top bracket K-K50-OK

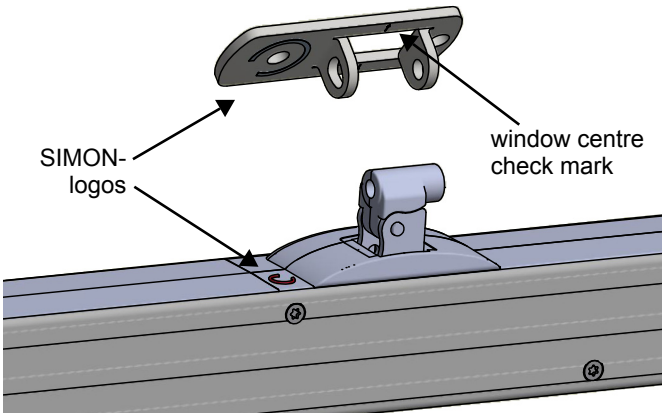
ATTENTION

The top bracket must always be oriented so that the SIMON-logo of the console is on the same side of the chain as the SIMON-logo of the chain outlet.

INFORMATION

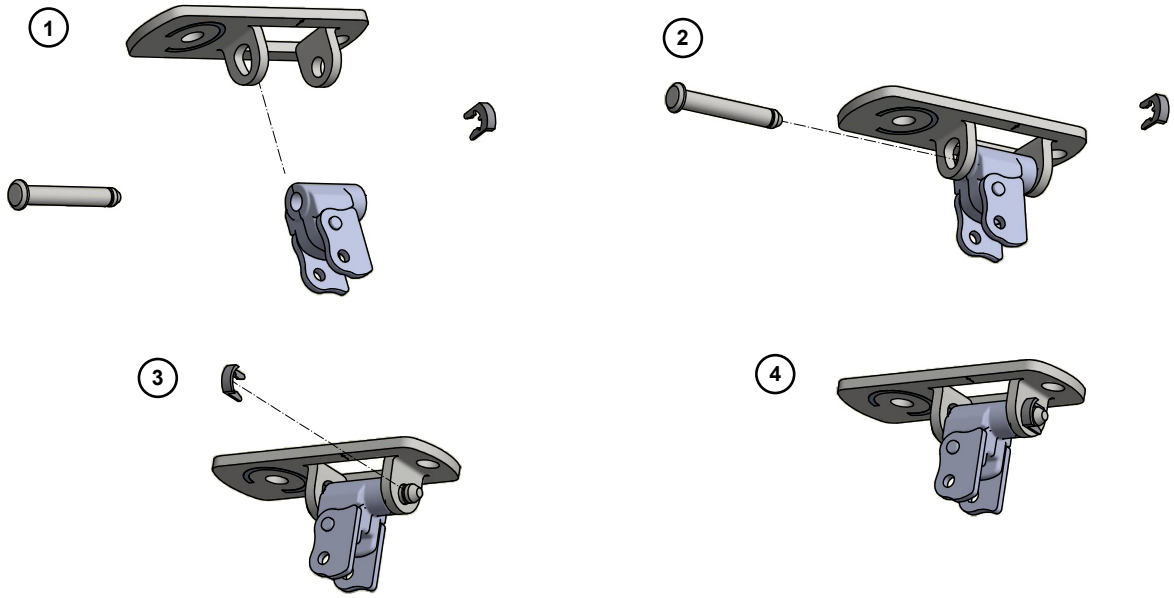
Check marks to align the bracket on the window sash centre (single version) or at 1/4 distance from the edges (left / right) of the window sash in parallel operation (see Figure 9).

Figure 9



➢ Drive the chain about 10 cm and connect the chain end with the K-K50-OK (1). Put in the mounting bolts from the side with logo (2) and save it on the other side with the retaining ring (3).

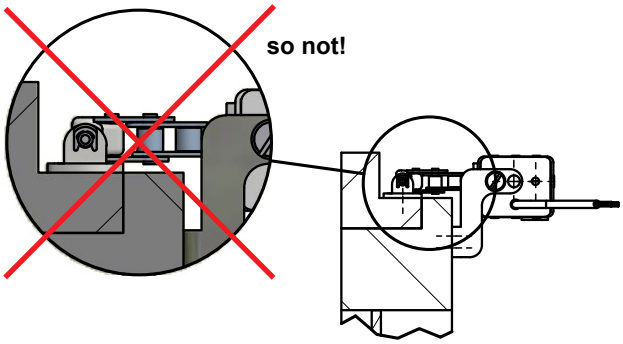
Figure 10



ATTENTION

The top bracket K-K50-OK must **not** be mounted rotated because its function would no longer be guaranteed all-embracing (see Figure 11: “Incorrect positioning of the K-K50-OK”).

Figure 11: Incorrect positioning of the K-K50-OK



Mounting

4.1.3 Inward opening top bracket K-K30-AKI

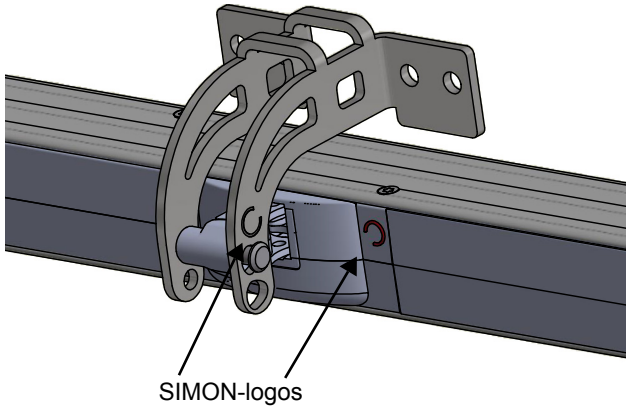
ATTENTION

For folding wings application the inward opening top bracket must always be oriented so that the SIMON-logo of the console is on the same side as the SIMON-logo of the chain outlet.

INFORMATION

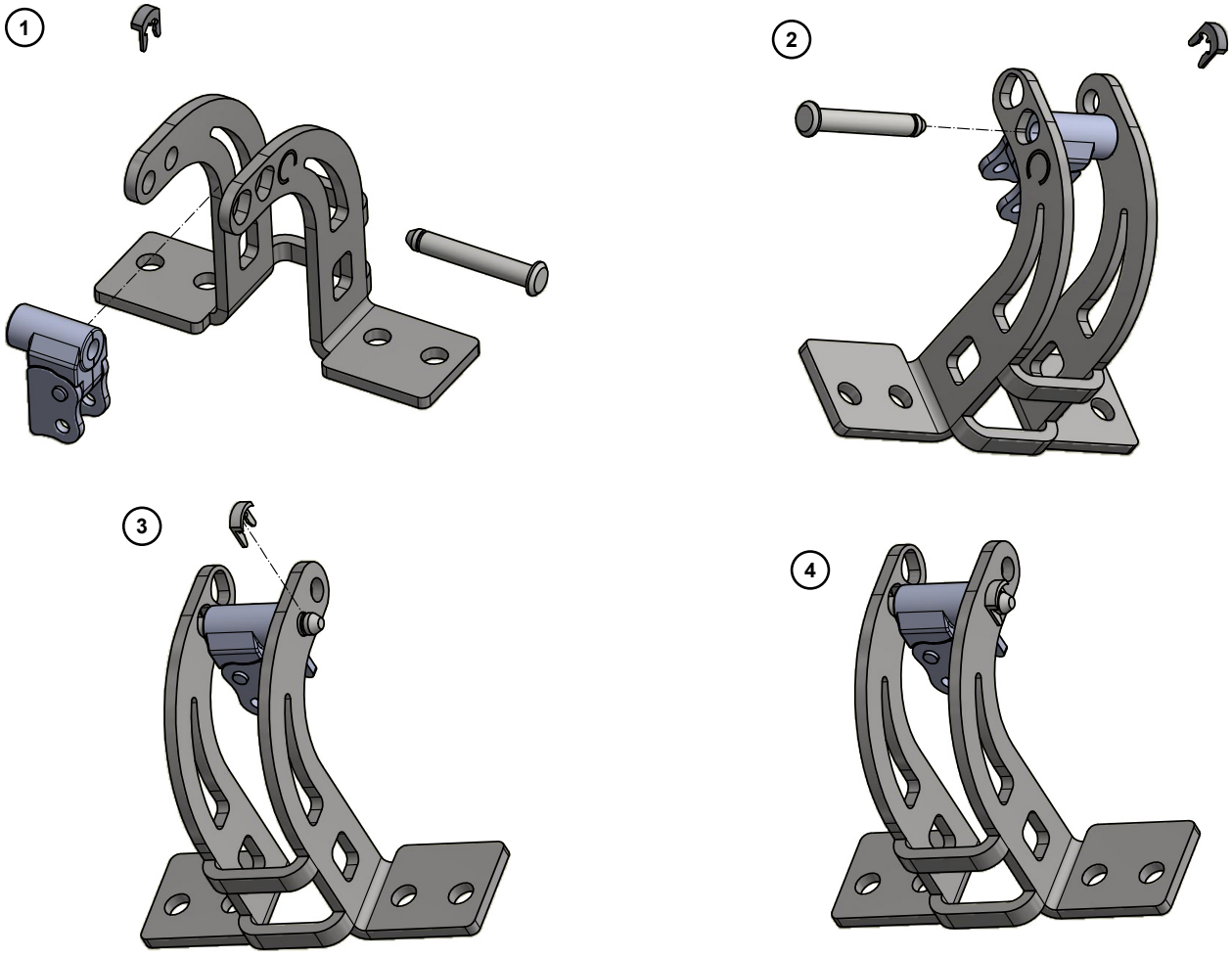
Depending on the characteristics and shape of the window sash window heights in relation to the actuator stroke (opening width) of about 2 : 1 are possible, if you use the inner mounting holes for the mounting bolt. If you use the outer mounting holes the relationship changes to about 3 : 2.
These are only approximate values and need to be clarified in doubt before mounting!

Figure 12



➢ Drive the chain about 10 cm and connect the chain end with the K-K30-AKI (1). Put in the mounting bolts from the side with logo (2) and save it on the other side with the retaining ring (3).

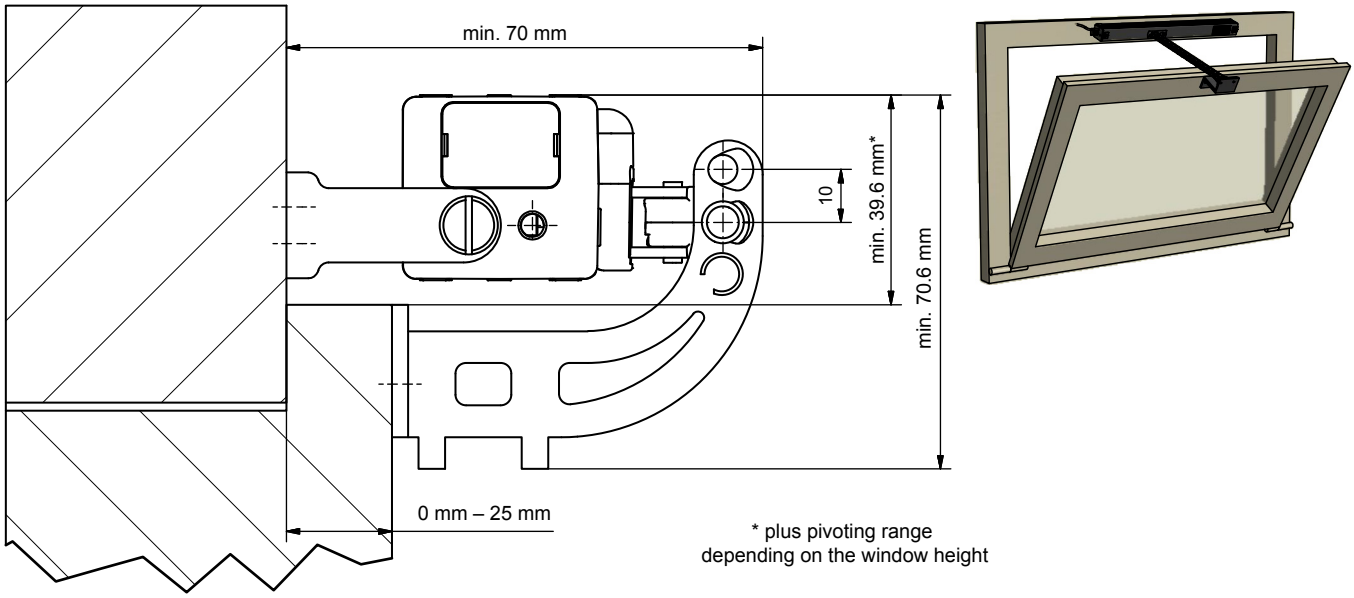
Figure 13



Mounting

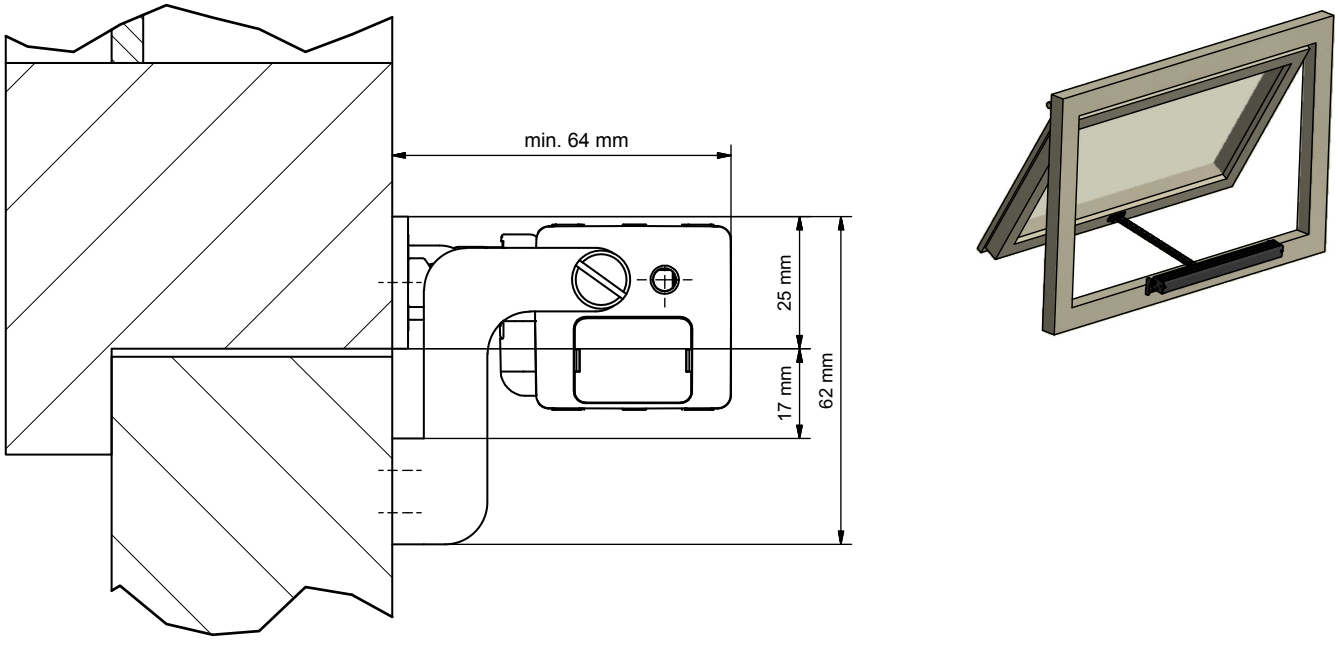
4.1.4 Inward opening top/ hung window, mounting at the blind frame

Figure 14: Bottom hung window, inward opening



4.1.5 Outward opening top/bottom hung window, mounting at the blind frame

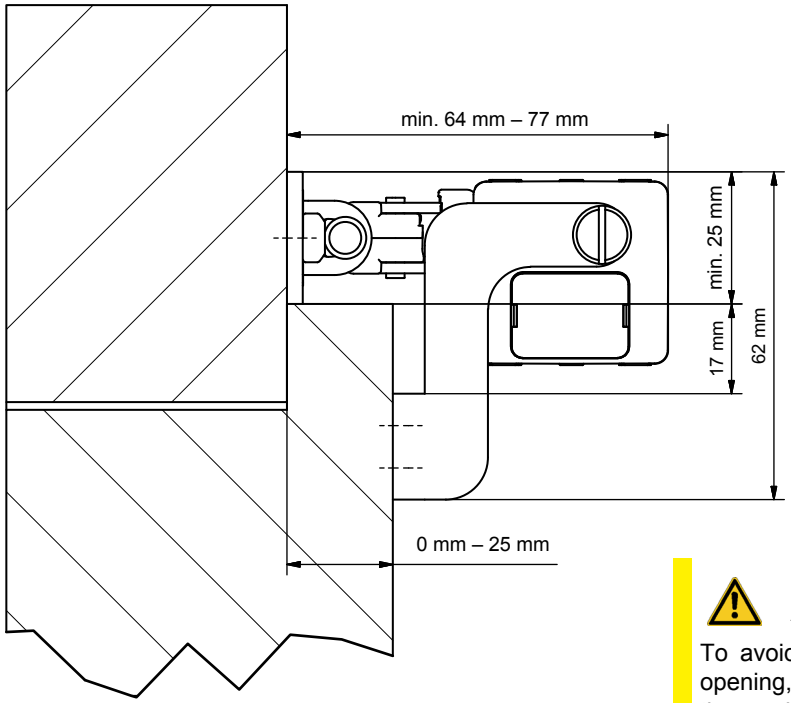
Figure 15: Top hung window, outward opening

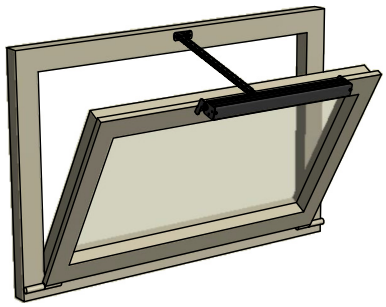


Mounting

4.1.6 Inward opening top/bottom hung window, mounting at the window frame

Figure 16: Bottom hung window





ATTENTION

To avoid damage on the windows and the chain during opening, place the actuator in this way that the chain has the maximum possible distance from the window frame.

4.1.7 Calculate force/stroke

This calculation is only valid for vertically mounted wall windows. For other installation a detailed calculation must be done, where we can assist.

F := force of the actuator [N]
S := stroke of the actuator [mm]
H := height of the wing frame [mm]
W:= weight of the wing frame [kg]

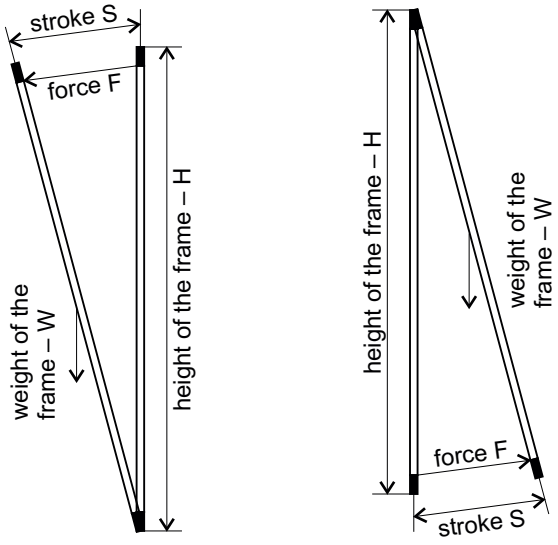
Required force of the actuator at specified stroke:

F = (W / 2) x (S / H) x 10
= (W x S x 5) / H

Maximum possible stroke of the actuator at a given force:

S = (2 x F x H) / (W x 10)
= (F x H) / (W x 5)

Figure 17



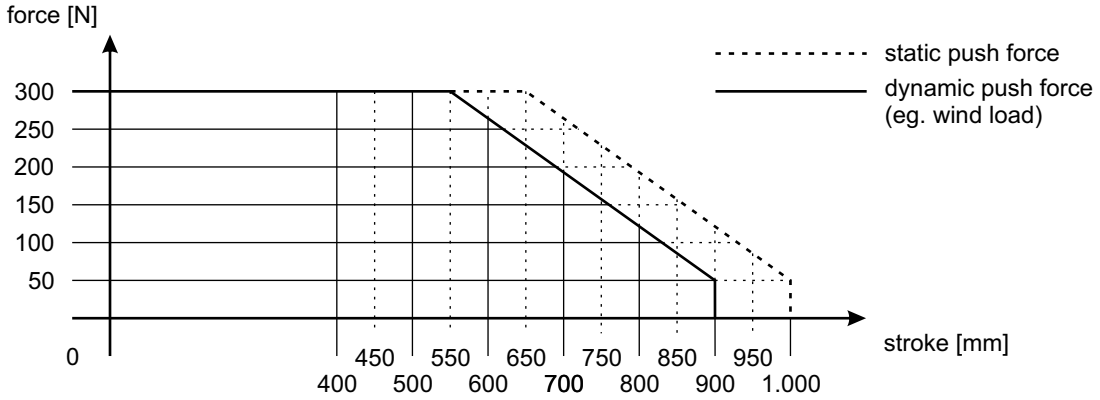
bottom hung window

top hung window

Mounting

4.1.8 Permitted push force to the chain

Figure 18



4.2 Soft-close range

4.2.1 Speed reduction

The actuator has a factory activated speed reduction on the last 75 mm before reaching the end position "CLOSED" (see Table 1: “Electrical characteristics” on page 4 and Figure 20: “Parametrisation ranges” on page 15).

ATTENTION

To prevent damage to the window and to the actuator or worse to people automatically when the speed reduction is activated the cut-off current is set to 0.3 A. This is equivalent to a force of 150 N.
With active speed reduction the cut-off current limit can be increase up to max. 0.5 A (300 N) via SIMON-link.

4.2.2 Current reduction

After reaching the last 75 mm before end position “CLOSE” the soft-close current reduction is active, by default 0.3 A. With deactivated speed reduction this value can be increase up to 1.0 A via SIMON-Link (see chapter 4.4 “SIMON-link” on page 15).

4.3 Electrical connection

ATTENTION

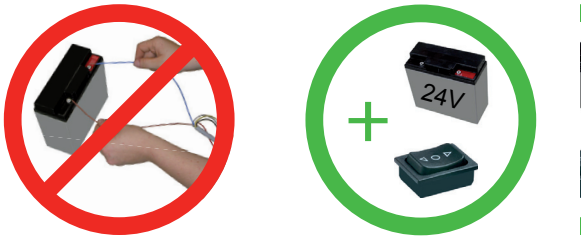
To avoid damages of actuators connection cable during movement of window ensure cable loops with sufficient distance to all moving parts.

DANGER

Check the complete system before connecting to the power supply (24 V DC).

INFORMATION

We recommend that a test run be carried out using a appropriate mobile power supply (including control unit, no battery alone). This allows simple and fast reaction to malfunctions.



ATTENTION

Do not earth the electrical connection.
The actuator may only be run with 24 V DC protective low voltage!
Insulate all unused wires.

Mounting

4.3.1 Power supply

The dimension of the power supply has to be suitable for this actuator. Both voltage and current must fit the specifications on the type label. Check the power supply before starting for the first time, particularly noting the right wire cross-section. Comply with the relevant directives with respect to minimum values for lead dimensioning. Typical calculation (these are only approximate values and this is not an accurate calculation):

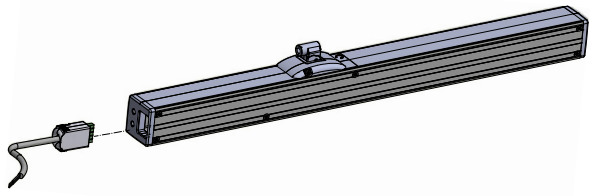
INFORMATION

Motor cable – notes on dimensioning (rule of thumbs):

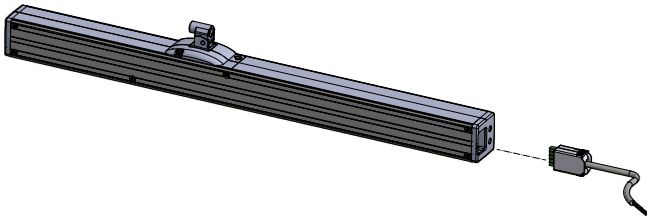
wire cross-section [mm²] = single wire length [m]
x number of actuators
x power consumption per actuator [A]
/ 73.

The national regulations are valid.

The power supply of the EA-K-30/xxx-T takes place on the gearbox side.



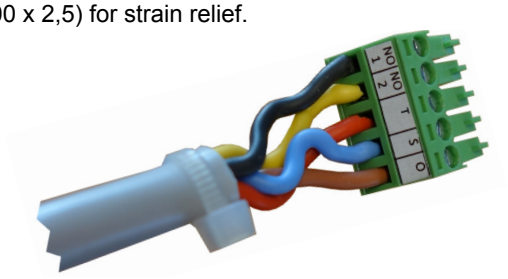
With the EA-K-30/xxx-DA (double-side connection) the power supply can also take place on the chain side. The supply voltage is internally forwarded to the opposite terminal. The connection terminal can be used to connect and feed a further actuator (see chapter 4.3.8 “DUO-operation” on page 14).



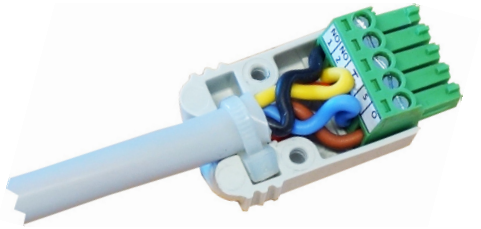
4.3.2 Supply / connecting cable

In tandem / DUO-operation, it is possible to supply the second actuator directly by the first drive (DA version). For this purpose, the connection cable can be upgraded to a connecting cable.

- Shorten the second connecting line to the desired length (plus ca. 3 cm)
- Dismantle 18 mm and remove the insulation of the 5 wires about 4 mm.
- Connect the 5 wires with the plug (see chapter 4.3.8 “DUO-operation” on page 14) and apply a cable tie (e.g. 100 x 2,5) for strain relief.



- Set the green plug and the cable tie in the lower shell of the connector housing and fix the upper shell with the two screws.



4.3.3 Feedback signal – „F“-contact

It is possible to create a classical “F”-contact by using the volt-free contact. Therefore connect of the yellow wire (NO2) and blue wire (S) (see chapter 4.3.7 “Single-connection – “F”-contact” on page 14). In addition, the triggering of the contact in end position “OPEN” and “CLOSE” must be activated via SIMON link.

4.3.4 Feedback contact – volt-free contact

The normally open contact (NO1, NO2) is only switched when the actuator is cut off in the “CLOSED” end position. This means that the signal is stroke-dependent and can be evaluated as a “CLOSED signal”. Other switch settings as “OPEN” end position are adjustable via SIMON link.

INFORMATION

The output of the volt-free contact is only on the gearbox side of the actuator (see Figure 19: “Parametrisation port for SIMON-link” on page 15).

4.3.5 Feedback contact – tandem-port

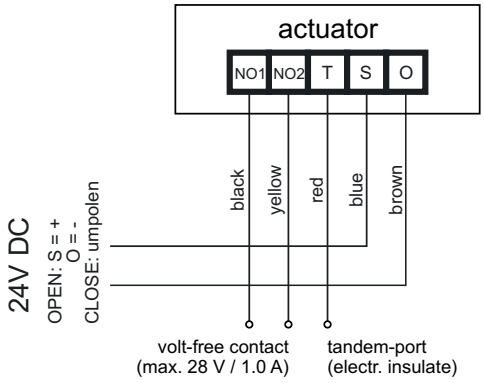
ATTENTION

Exclusively a cut-off signal (e.g. overload cut-off) is relayed to the parallel connected actuator. The cables or functions of the actuators connected in parallel are not monitored and therefore do not lead to the shutting down of the actuators connected in parallel.

Mounting

4.3.6 Single-connection – volt-free contact

➢ Connect leads according to wiring diagram.

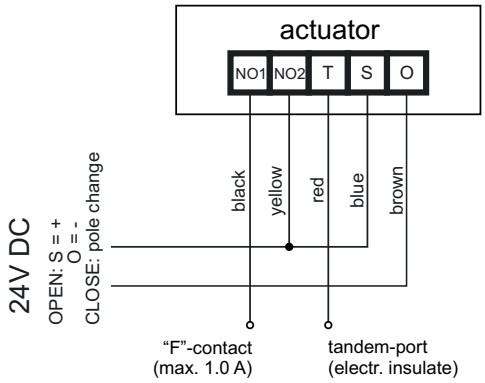


ATTENTION

When not use, the red wire (T) must be electrically insulated. The red wire should be connected only to the red line of a parallel connected actuator.

4.3.7 Single-connection – “F”-contact

➢ Connect leads according to wiring diagram.



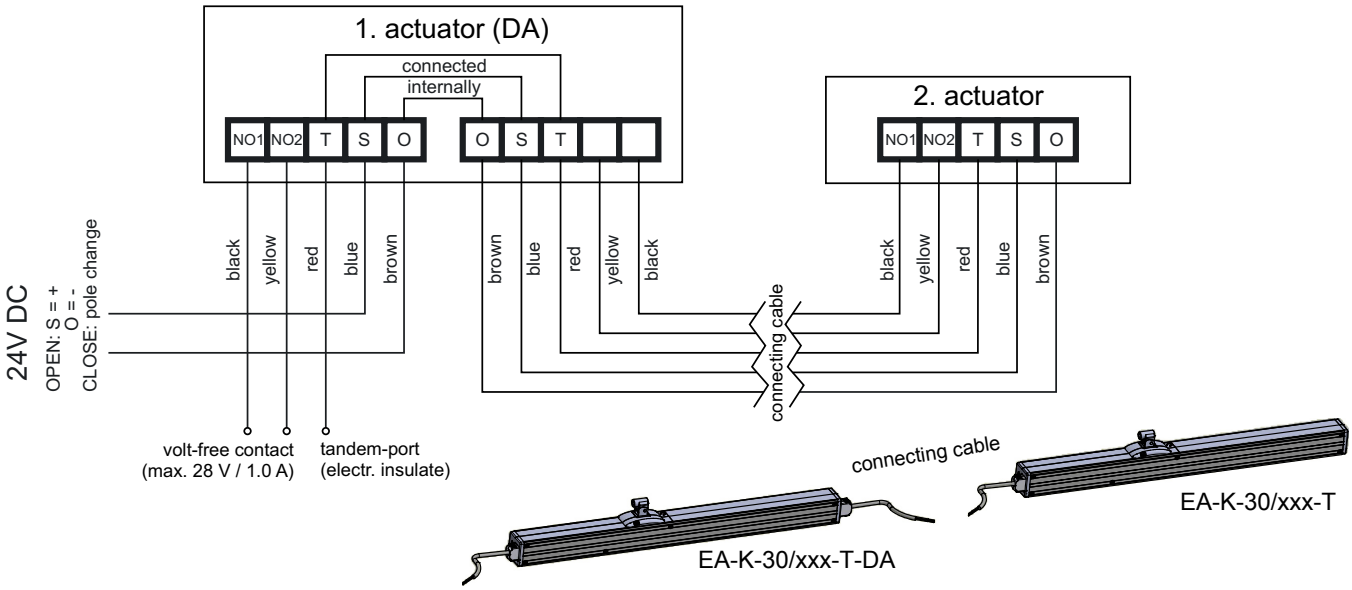
ATTENTION

When not use, the red wire (T) must be electrically insulated. The red wire should be connected only to the red line of a parallel connected actuator.
The “F”-contact (black) must not be clamped to ground and not in parallel!

4.3.8 DUO-operation

You can connect two actuators in parallel-operation (e.g. on huge window frames). If one actuator stops in case of an overload cut-off the cut-off signal is transferred to the parallel connected actuator, which will stop after a scheduled time (see Table 1: “Electrical characteristics” on page 4 and Figure 20: “Parametrisation ranges” on page 15).

➢ Connect leads according to wiring diagram.



ATTENTION

The actuators run at the same time. Power supply and cable dimension must be calculated according to total current consumption.

ATTENTION

Only 2 actuators can be connected together in DUO-operation. Maximum cable length between the actuators 10 m!

Mounting

4.4 SIMON-link

INFORMATION

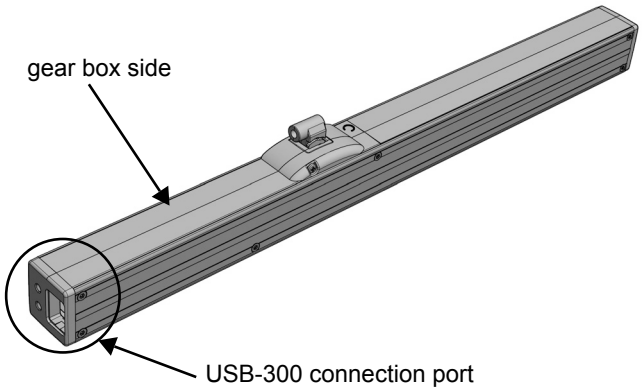
To set parameters via SIMON-link you need a USB-300 service cable and the supporting software (version 2.0.0 or higher).
For further information visit **www.simon-rwa.com**.

SIMON LINK®

The actuator has a parametrisation port (gear box side), at via SIMON-link

- the stroke can be limited electronically (beginning with 100 mm stroke),
- forces in “OPEN” and “CLOSE” direction can be adjusted,
- the soft-close current can be set (see chapter 4.2 “Soft-close range” on page 12),
- the speed reduction 75 mm before end position “CLOSE” (soft-close range) can be adjusted (see Figure 20: “Parametrisation ranges”),
- the switching behaviour of the volt-free contact can be set,
- a detailed status report of the actuator can be read out.

Figure 19: Parametrisation port for SIMON-link



ATTENTION

The overload cut-off of the actuator is powered through the USB-300 cable during parametrisation.
There **must not** be an external power supply applied at this time (EA-K-30 / xxx T-DA on the chain side). A wrong handling can harm the USB input of the connected computer device.

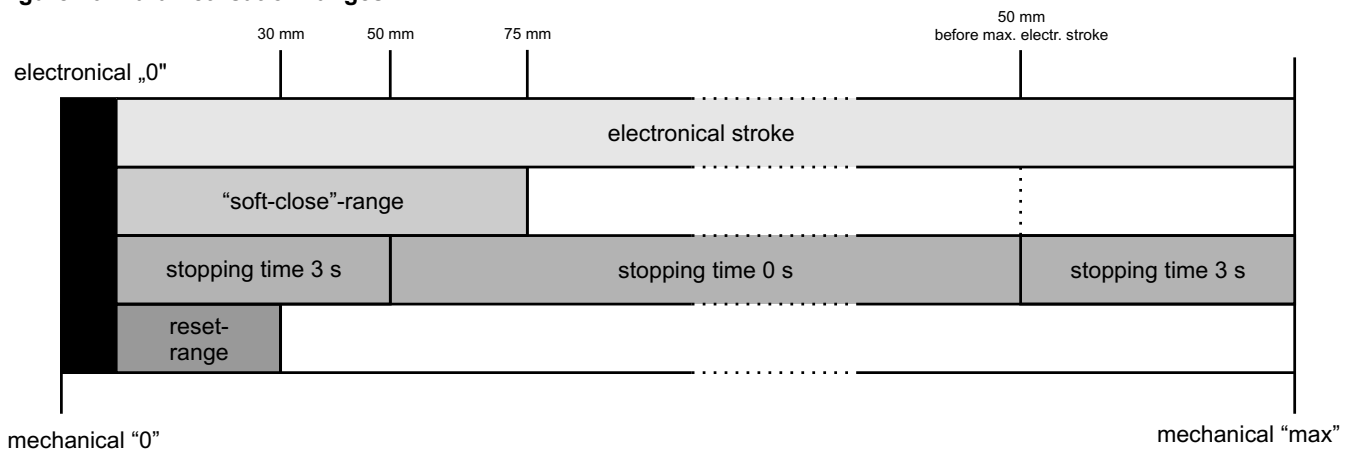
4.5 Parametrisation ranges

“soft-close” range: moving with the electronic “0”-point, the speed reduction is set ON or OFF and the soft-close current I_{SC} can be adjusted via SIMON-Link (see chapter 4.2 “Soft-close range” on page 12).

reset-range: electronic “0” is reset at overload cut-off in direction “CLOSE” in this range.

stroke: electronic stroke limitation as programmed (beginning with 100 mm stroke).

Figure 20: Parametrisation ranges



Commissioning

5. Commissioning

See additional sheet “Safety instructions and terms of guarantee”!

6. Care and maintenance

See additional sheet “Safety instructions and terms of guarantee”!

7. Fault finding

Malfunction	Possible causes	Failure correction
The actuator does not work.	– No mains voltage; – Connection cable defective; – Wind-/rain-detector has been activated.	– Check the fuse and the supply cable; – Check the connection cable; – Not a malfunction.
The actuator runs in the wrong direction.	– Connection terminals “+ / -” wrong way round; S = blue; O = brown.	– Swap connection terminals “S” and “O”.
The actuator drives beyond its programmed stroke.	– Shift of the electronic zero point.	– Trigger the actuator in “CLOSING” direction and let it cut of in end position “CLOSE”.

8. Appendix

8.1 General conditions of business and terms of delivery

The currently valid conditions for products and services of the electrical and electronics industry (green delivery terms) apply for deliveries and services, including the supplementary clause “Extended retention of title”. These are published by ZVEI Frankfurt. If you are not familiar with these, we would be happy to send them to you. The agreements are also available for download a **www.simon-rwa.com**.

Passau is the established legal venue.

8.2 Manufacturer’s declaration

CE We hereby declare the conformity of the product with the applicable guidelines. The declaration of conformity can be viewed in the company and will be delivered upon request. This declaration certifies conformity with the directives mentioned, but gives no guarantee of characteristics. This declaration becomes invalid following a change that has been made without our consent.

8.3 EC manufacturer’s declaration (distributor)

The installer is responsible for the proper mounting or commissioning and the preparation of the declaration of conformity in accordance with the EU directives.

INFORMATION

The installer is responsible for affixing the CE marking. The CE-marking is to be affixed in a visible place!

8.4 Company addresses

8.4.1 Germany

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Your **Simon RWA** partner: