Chain Actuator - EA-K-50



### **EA-K-50/xxx EN 1.0**

### Only valid for the following article numbers:

- M2 5310(-T) 500 mm stroke
- M2 5311(-T) 600 mm stroke
- M2 5312(-T) 750 mm stroke
- M2 5313(-T) 1,000 mm stroke



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## Chain Actuator – EA-K-50



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### In general

#### 1. In general

#### 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:



#### INIEO

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 console range.

The distinguished technical features are:

- · soft start
- compact exterior
- low power consumption
- extreme smoothness
- low noise level
- soft-close range (75 mm before reaching the end position "CLOSE") with lower cutoff current
- electronic zero point reset within the first 30 mm of stroke
- stroke parameterisable via SIMON-Link (beginning with 100 mm stroke)



## Chain Actuator – EA-K-50



## In general

#### 1.5 Technical data

**Table 1: Electrical characteristics** 

Actuator type/version	EA-K-50
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 <sup>1</sup> :	1.4 A
Maximum starting current:	1.54 A
Maximum cut-off current in 'OPENING' and 'CLOSING' direction <sup>2</sup> :	1.4 A
Softclose current <sup>3</sup> :	0.5 A
Current consumption after cut-off (closed current):	65 mA
Cut-off via:	built-in electronic overload cut-off
Maximum permissible number of actuator units connected in parallel <sup>4</sup> :	4
Cable length between two actuators in tandem mode:	max. 10 m
Run-on time <sup>5</sup> :	500 ms
Pulse time <sup>6</sup> :	300 ms
Protection class:	III

- 1. Maximum current consumption with nominal load.
- 2. Parameterisable via SIMON-Link.
- Soft-close range: last 75 mm before reaching the end position "CLOSE", soft-close current parameterisable via SIMON-Link – current range: 0.5 A – 1.4 A.
- 4. With common cut-off function (tandem function).
- The run-on time indicates how long the actuators connected in parallel remain powered after the trigger actuator is shut down.
- The pulse time indicates how long the internal or external overload cut-off provides the cut-off signal at the output.

Table 2: Follow contact (F) - standard version

Actuator type/version	EA-K-50
Rated voltage:	See "permissible rated voltage range" in Table 1: "Electrical characteristics".
Relay contact load:	1.0 A

After reaching any end position the potential of "S" is forwarded to the "F" output.



#### **ATTENTION**

The maximum contact load (see Table 2: "Follow contact (F) – standard version") must not be exceeded.

Table 3: Volt-free contact (C1, C2) - tandem version

Actuator type/version	EA-K-50
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'.



#### **ATTENTION**

The maximum contact load (see Table 3: "Volt-free contact (C1, C2) – tandem version") must not be exceeded.

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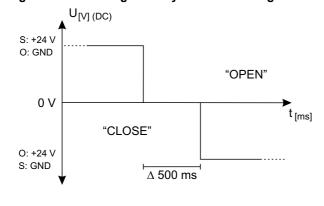
## In general

Table 4: Connection and operation

Actuator type/version	EA-K-50
Silicone connection cable <sup>1</sup> :	3 x 0.75 mm²/ 6 x 0.75 mm²
Connection cable length <sup>2</sup> :	3 m
Pause when changing direction <sup>3</sup> :	min. 500 ms
Switch-on duration:	ED 30%
Stability of opening and closing cycles:	> 11,000
Sound level <sup>4</sup> :	< 50 dB (A)
Multiple triggering as per prEN 12101-9:	allowed
Multiple triggering after stop:	allowed
Maintenance:	See chapter 6. "Care and Maintenance" on page 18.

- Standard version: 3-wire/ Tandem version: 6-wire.
- 2. Optional lengths possible.
- 3. It is important that we have a zero-voltage part of 500 ms (see Figure 1: "Zero-Voltage Part by Direction Change").
- Measured at a distance of one metre under normal conditions.

Figure 1: Zero-Voltage Part by Direction Change



## <u>^</u>

#### **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 5: Installation and environmental conditions

Actuator type/version	EA-K-50
Rated operating temperature:	20 °C
Permissible ambient temperature range:	-5 to 75 °C
Temperature stability (SHEV):	300 °C
Ingress protection:	IP 32
Usage range:	Central European environ- mental conditions ≤ 2,000 metres above sea level

Table 6: Approvals and certificates

Actuator type/version	EA-K-50
CE-compliant:	in accordance with EMC directive 2004/108/EC and the low-voltage directive 2006/95/EC
Further approvals:	on request

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## In general

**Table 7: Mechanical characteristics** 

Actuator type/version	EA-K-50
Maximum compressive force:	500 N
Maximum tractive force <sup>1</sup> :	500 N
Condition of loading:	Opening against nominal load / Closing with nominal load support
Nominal locking force:	700 N
Nominal stroke <sup>2</sup> - 500 mm: - 600 mm: - 750 mm: - 1.000 mm:	500 mm 600 mm 750 mm 1.000 mm
Stroke speed with nominal load <sup>3</sup> - 500 N:  - 400 N:  - 300 N:	11.0 mm/s 12.4 mm/s 13.5 mm/s
Stroke speed with a part load <sup>4</sup> - 500 N: - 400 N: - 300 N:	12.8 mm/s 13.9 mm/s 14.7 mm/s
Material surface:	Alu E6/EV1 – Finishing <sup>5</sup> in any standard RAL and DB colour available on request!
Material chain:	corrosion-resistant monosta- ble steel chain, silver plated
Dimensions (L x H <sup>6</sup> x W)  – 500 mm Hub:  – 600 mm Hub:  – 750 mm Hub:  – 1.000 mm Hub;	530 x 50 x 41 mm 580 x 50 x 41 mm 655 x 50 x 41 mm 780 x 50 x 41 mm
Weight <sup>7</sup> – 500 mm Hub:  – 600 mm Hub:  – 750 mm Hub:  – 1.000 mm Hub:	2.25 kg 2.39 kg 2.61 kg 2.97 kg

- 1. Other values are possible as options
- The nominal stroke can deviate to max. ± 3% by mechanical damping and tolerances, but not more than 20 mm
- 3. In relation to a stroke of 500 mm; tolerance ± 10%.
- In relation to a stroke of 50 mm with part load of 70%; tolerance ± 10%.
- Attention: nuts, bolts, washers, sliders and similar individual parts are not coated.
- 6. Plus the amount of the chain exit (20 mm).
- 7. Data including standard 3-wire cable.

**Table 8: Accessories** 

Actuator type/version	EA-K-50
Mechanical connection to the actuator:	A wide selection of bracket sets is available. The techni-
Mechanical connection to the actuator housing:	cal data apply only in conjunction with original accessories!

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## Safety regulations

### 2. Safety regulations

FOR THE SAFETY OF PERSONS IT IS IMPORTANT TO FOLLOW THESE INSTRUCTIONS. THESE INSTRUCTIONS ARE TO BE KEPT AND HANDED TO THE CUSTOMER FOLLOWING INSTALLATION AND COMMISSIONING.



#### **DANGER**

Do not allow unauthorised persons (e. g. children) to operate permanently installed control panels. Keep remote controls out of reach of unauthorised persons.



#### **DANGER**

Please consider VDE 0833 for hazard alert systems, VDE 0100 for electrical systems, DIN 18232 for SHEV systems, the local fire department regulations, the energy supply company regulations for the mains connection as well as BGV A3 and the BG regulation BGR 232. All relevant national safety regulations and rules apply to the bringing onto the market, installation and commissioning of the equipment outside the country of manufacture (Germany).



#### **DANGER**

Free access must be ensured to the energy supplies and electrical control panels of SHEV systems.



#### **DANGER**

The sign for the manual release must be attached permanently in the vicinity of its actuating element.



#### **DANGER**

Force operated windows which are lower than 2.5 m above the top edge of the finished floor (even if this only applies to parts of the window) require a risk assessment with regard to the danger of persons being crushed or trapped. Several national and international regulations regulate the protective measures necessary depending upon the type of use of the window. A risk analysis must be carried out.

The building planner / architect or the entity issuing the invitation to bid must clearly specify the requirements for force operated windows. This includes agreement with the responsible authorities (e. g. building authority) and, if necessary in the case of commercial and public use, with the involvement of the responsible insurance company. The client who installs the force operated window is responsible for adherence to the tendering specifications, taking into account technical rules and the state of the art. The client / customer / user must ensure that force operated windows are operated and maintained in accordance with the user information/operating instructions.

The regulations (BGR 232) of the association of commercial and industrial workers' compensation insurance carriers have to be considered! Other persons must be kept away if a switch with an 'off' presetting is operated or if a window closes that had been opened by a fire alarm system.



#### DANGER

The actuating element of switches with an 'off' presetting must be installed in a place with a direct line of sight to the driven part, but away from moving parts. If it is not a key switch, it must be installed at a height of at least 1.5 m and must be inaccessible to the public.



#### DANGER

If the opening actuators are used with SHEV systems, ensure that controllers that can be locked can only be active when no other person is in the room.

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## **Figures**

### 3. Figures

Figure 2: Chain actuator

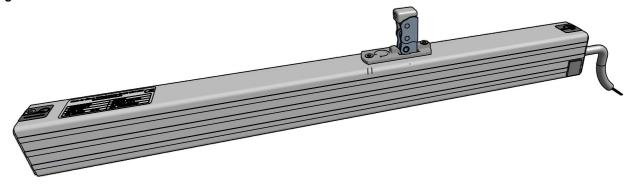


Figure 3: Upper bracket K-K50-OK (K2 5089)





Figure 4: Lower bracket K-K50-A (K2 5086)

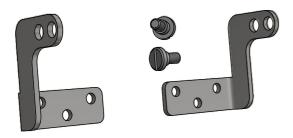


Figure 6: Supporting bracket inside K-K50-SKI (K2 5088)

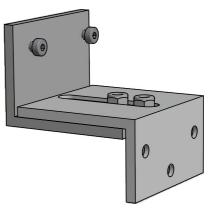


Figure 5: Lower bracket K-K50-K (K2 5087)



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### Mounting

#### 4. Mounting



#### INFO

Information can be found in the ZVEI data sheet 'Force operated windows' (www.simon-rwa.de).



#### **DANGER**

Mounting may be carried out only by professional personnel (qualified electrician)! 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.



#### **DANGER**

A restrictor stay with sufficient stroke must be installed at bottom hung wings.

It must be ensured that the actuator fastening to the window or wing frame is permanent and suitable for the actuator force mentioned on the type plate.

#### 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 upper bracket K-K50-OK the brackets (see page 8) must be ordered separately.



#### **ATTENTION**

Consider the static properties of the frame for the installation of the drive.

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 drive that the actuator chain is extended a small piece after mounting, but after installation no more than 25 mm, otherwise the electronic zero-reset does not work anymore.

#### 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.
- ➤ Mount the brackets with screws (suitable for the respective window, screws not included), see figures on page 11 to page 12.
- > Insert the actuator into the mounting brackets (K-K50-K or K-K50-A) and fix them with the two captive screws.

Figure 7

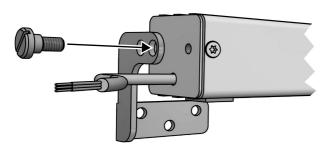
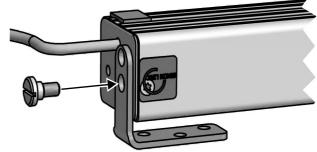


Figure 8



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## Mounting

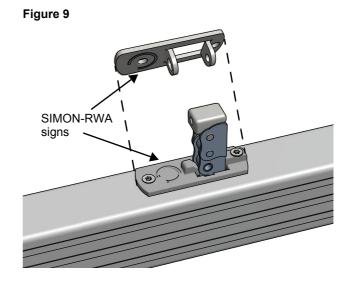
### 4.1.2 Upper bracket K-K50-OK



#### **ATTENTION**

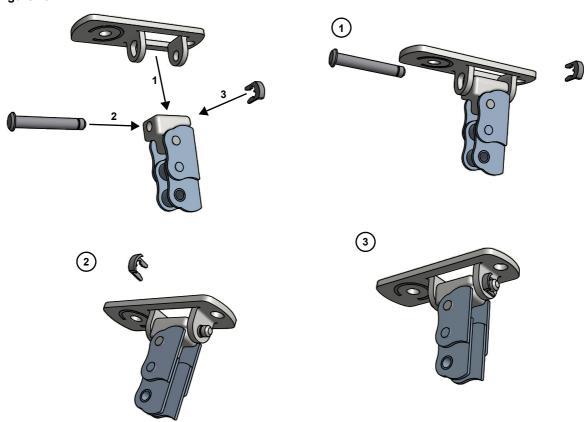
The upper bracket must always be oriented so that the logo of the console is on the same side of the chain as the logo of the chain outlet.

Make sure that the upper bracket and the chain exit are flush.



> 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



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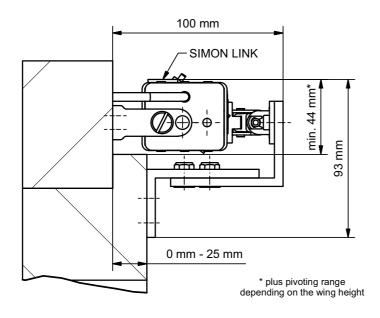
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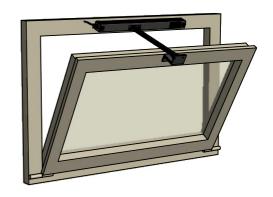


## Mounting

### 4.1.3 Inward opening top/bottom hung window, mounting at the blind frame

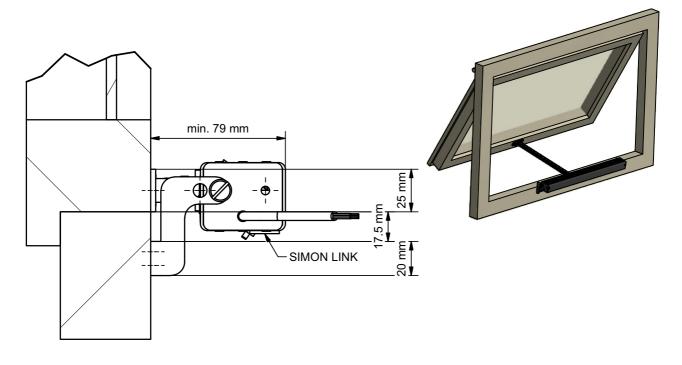
Figure 11: Bottom hung window





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

Figure 12: Top hung window



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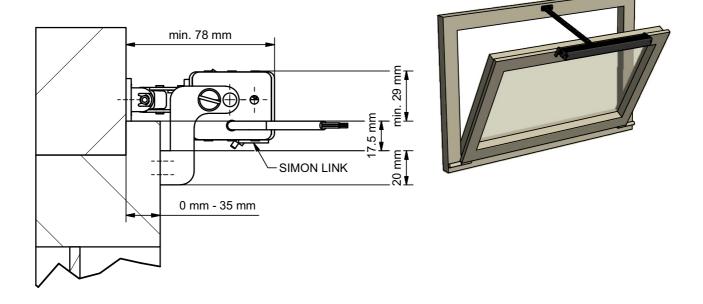
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## Mounting

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

Figure 13: Bottom hung window





### **ATTENTION**

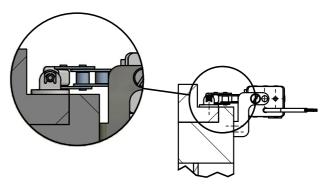
To avoid damage on the windows and the chain during opening, place the actuator in this way that the chain is the maximum distance from the window frame.



## **ATTENTION**

The upper bracket K-K50-OK must not be mounted rotated because it's function would no longer be guaranteed all-embracing (see Figure 14: "Incorrect positioning of the K-K50-OK").

Figure 14: Incorrect positioning of the K-K50-OK



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## Mounting

#### 4.2 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]

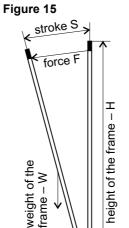
W:= weight of the wing frame [kg]

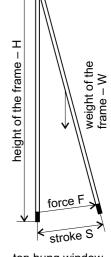
Required force of the actuator at specified stroke:

$$F = (W / 2) \times (S / H) \times 10$$
  
=  $(W \times S \times 5) / H$ 

Maximum possible stroke of the actuator at a given force:

$$S = (2 \times F \times H) / (W \times 10)$$
  
=  $(F \times H) / (W \times 5)$ 



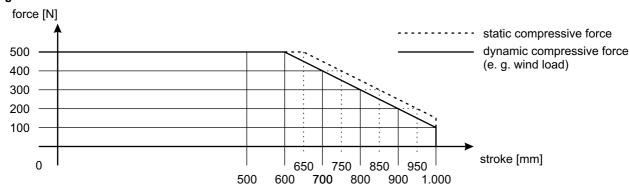


bottom hung window

top hung window

#### 4.2.1 Permitted compressive force to the chain

Figure 16



## 4.3 Electrical Connection



#### **ATTENTION**

Make sure that the loops in the supply cable near moving parts are sufficiently large to prevent the connecting cable from becoming trapped or being torn away.



#### INFO

We recommend that a test run be carried out using a appropriate mobile power supply. This allows simple and fast reaction to malfunctions.



#### WARNING

Please check the complete system before connecting to the 24 V DC supply.



#### **ACHTUNG**

Do not earth the electrical connection.

The actuator may only be run with 24 V DC protective low voltage!

Insulate any unused wires.

### Chain Actuator – EA-K-50



### Mounting

The dimension of power supply has to be suitable for this actuator. Both voltage and current must agree with the specifications on the type label. Check the power cables before starting for the first time, particularly noting the 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):

#### wire cross-section [mm2] :=

0,019 x number of actuators
x current consumption per actuator [A]
x length of wire [m]

#### 4.3.1 Feedback signal - "F"-contact

Required e. g. for control purposes, running displays etc.

After switching off the actuator the integrated control electronics switch the respectively positive or negative operating voltage from "S" to the feedback contact "F" (black wire). Sequence signal (e. g. feedback) via "F" contact.

## **4.3.2 Feedback signal – volt-free contact** (only in tandem version with 6-wire cabling)

The normally open contact (C1, C2) 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".

## 4.3.3 Feedback signal – tandem-port (only in tandem version with 6-wire cabling)

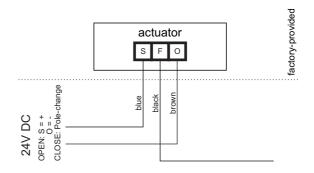


### **ATTENTION**

Exclusively a stop command and a cut-off signal (e. g. overload cut-off) are relayed to the actuators connected in parallel. 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.

#### 4.3.4 Single-connection - standard version

Connect leads according to wiring diagram (the wire colours are only valid for SIMON actuators with factoryfitted connection cables).





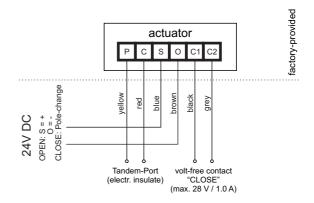
#### **ATTENTION**

Do not earth "F" nor loop it.

Depending on the application insulate the feedback contact "F"!

## 4.3.5 Single-connection – version with volt-free contact (tandem version)

Connect leads according to wiring diagram (the wire colours are only valid for SIMON actuators with factoryfitted connection cables).





#### **ATTENTION**

When not use, the red and yellow wires must be electrically insulated.

Do not connect red and yellow wires of actuators.

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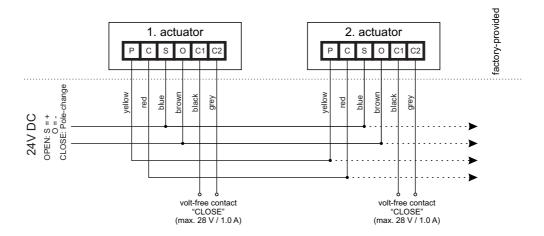


### Mounting

#### 4.3.6 Parallel-connection - tandem version

You can connect maximum four 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 actuators, which will stop after a scheduled time (see Table 1: "Electrical characteristics" on page 4).

Connect leads according to wiring diagram (the wire colours are only valid for SIMON actuators with factory-fitted connection cables).





### ATTENTION

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



#### **ATTENTION**

Connect maximum four actuators in parallel-operation. Maximum cable length between the actuators: 10 m.



#### **ATTENTION**

After switching off the actuator in driving direction "CLOSE" the integrated control electronics switch the normally open contact (C1, C2), this means that the signal is stroke-dependent and can be evaluated as a "CLOSED signal".

The red and yellow wires are connected correspondingly red to red and yellow to yellow in the case of parallel connected actuators (maximum four). Do not connect red and yellow wires of actuators.

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### Mounting

#### 4.4 SIMON-Link



#### INFO

To set parameters via SIMON link you need a USB-200 service cable and the supporting software. For more information visit **www.simon-rwa.de**.

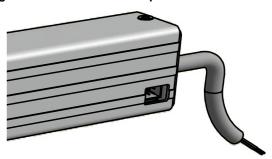


The actuator has a parameterisation port, at via SIMON-Link

- 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 adjusted,
- a detailed status report of the actuator can be read out.

To read out data via SIMON-Link or to parameterise the actuator must be powered externally, ideally in the direction "CLOSE".

Figure 17: Parameterisation port for SIMON-Link



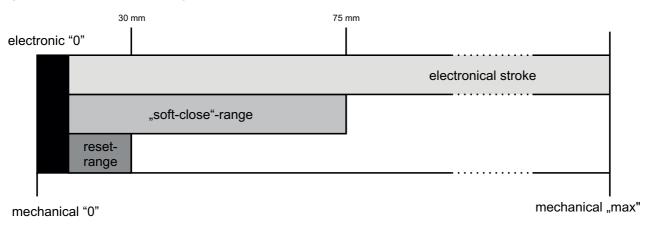
### 4.5 Parameterisation ranges

"soft-close"-range: moving with the electronic "0" point, I<sub>SC</sub> parameterisable via SIMON-Link.

Reset-range: electronic "0" is reset at overload cut-off in direction "CLOSE".

Stroke: electronic stroke limitation as programmed.

Figure 18: Parameterisation ranges



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## Commissioning

#### 5. Commissioning



#### **DANGER**

Following the installation it must be checked that the mechanism is correctly adjusted and that the safety system and the manual release, if installed, work correctly.



#### INFO

The power source must be appropriate for the actuator Both voltage and current must agree with the specifications on the type label. The specified voltage and current must also actually be made available on the connection cable. Voltage drops must be prevented by appropriate dimensioning of the supply cable.

Moreover, the regulations contained in the DIN VDE 0100 and DIN VDE 0298 standards apply.



#### **ATTENTION**

Before initial commissioning, the supply cabling must be checked. In particular, the cable cross section must be checked.

- Carry out the commissioning. Carry out a visual and functional check before switching the opening actuator on.
- If everything is in full working order, the actuator can be connected to the final power supply.



#### **DANGER**

The testing of plants is to be carried out in accordance with the applicable national regulations (in Germany these include DIN VDE 0100 part 600). To this end, make all necessary preparations: e. g. establish a PE connection to the housing cover.

#### Note for fitters:

In accordance with Appendix III of the machine directive, the CE marking must be permanently affixed to the product and must be visible and legible.

(See chapter 8.2 "EC Manufacturer's declaration (distributor)" on page 19.)

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#### **Care and Maintenance**

#### 6. Care and Maintenance



#### **ATTENTION**

The customer is obliged to check the function of the actuator periodically. In case of any defects please inform the installer at once. Please change defect parts immediately with original spare parts. The opening actuator may be opened exclusively by the manufacturer.



#### **DANGER**

Smoke and heat exhaust vent systems serve the protection of human lives and must therefore be maintained regularly – at least once a year – by a specialised company authorised by the manufacturer. The maintenance work carried out is to be documented.

The maintenance must be performed according to a checklist to be procured from the manufacturer.

#### 6.1 Environmental note



### **ENVIRONMENTAL NOTE**

The opening actuators are recyclable and must not be disposed of in the residual waste. According to the disposal law "ElektroG", this device must be disposed properly at the end of its life time. Please contact your waste disposal company if you have any questions.

### 6.2 Repair and replacement



#### **DANGER**

The opening actuator must not be used if repair or adjustment work needs to be carried out. The system must be disconnected on all poles from the mains and emergency current supplies before performing cleaning or other maintenance work.

The opening actuator may be repaired only by the manufacturer. The opening actuator must be replaced in the case of a fault of defect.

#### 6.3 Guarantee conditions

The product must be used as normally intended. The product is subject to natural wear and tear. In case of material defect claims, these shall be asserted in writing, stating the source of supply of the device. The following applies with respect to the guarantee: "General conditions for the supply of products and services of the electrical and electronics industry ("Green delivery terms" – GL)". These can be found at our homepage **www.simon-rwa.com**. We would be pleased to send you a copy upon request.

### Chain Actuator – EA-K-50



### **Troubleshooting**

#### 7. Troubleshooting

#### Table 9: Overview of faults

Malfunction	Possible causes	Failure correction
The actuator does not work.	- No mains voltage; - Connection cable defective; - Wind/rain detector has tripped.	- Check the fuse and the supply cable; - Check the connection cable; - Not a malfunction, maybe for fault finding disconnect the wind/rain detector.
The actuator runs in the wrong direction;	- Connecting terminals '+/-' wrong way round; S = blue; O = brown	- Swap connecting terminals 'S' and 'O'.

#### 8. Appendix

#### 8.1 Manufacturers's declaration

# $\epsilon$

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.

#### 8.2 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.



#### INEO

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

#### 8.3 Company addresses

#### 8.3.1 Germany

Simon RWA® Systeme GmbH Medienstr. 8 D – 94036 Passau Tel: +49 (0)851 98870 - 0 Fax: +49 (0)851 98870-70 E-mail: info@simon-rwa.de Internet: www.simon-rwa.de

#### 8.3.2 Switzerland

Simon RWA® Systeme AG Allmendstrasse 8 CH – 8320 Fehraltorf Tel: +41 (0)44 956 50 30 Fax: +41 (0)44 956 50 40 E-mail: info@simon-rwa.ch Internet: www.simon-rwa.ch

#### 8.3.3 Hungary

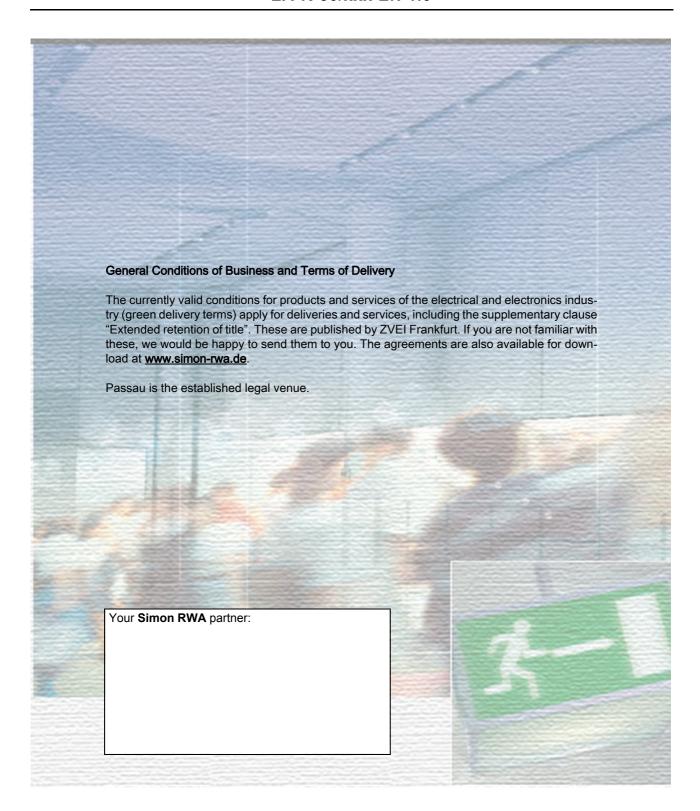
Simon RWA<sup>®</sup> Systeme Kft. Vezér uta 147 / D, 3rd Floor, No. 17 H – 1148 Budapest

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