

Operating Manual

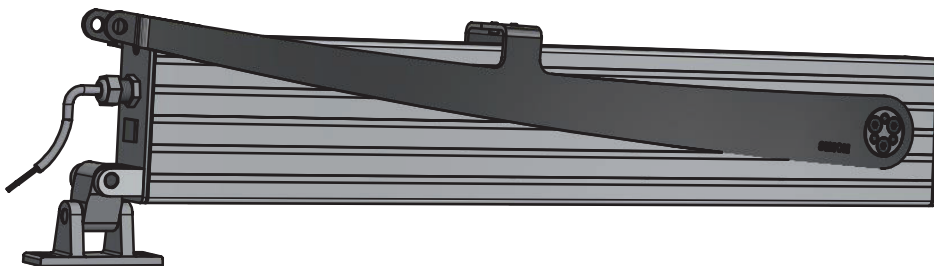
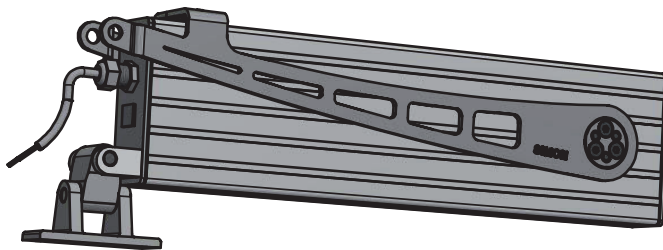
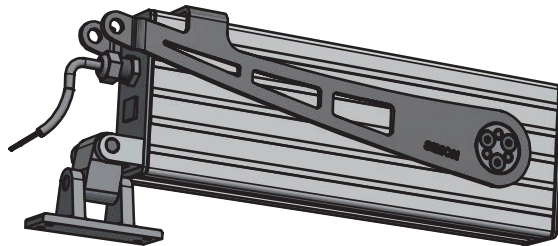
Folding Arm²

BA EA-KL²-K-xx (short) EA-KL²-xx EA-KL²-L (long) EN 2.0

For further information
please visit our product
website:



[short.simon-protec.com/
eakl2en](http://short.simon-protec.com/eakl2en)



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Subject to technical changes and errors. All figures are exemplary.



Only valid in combination with the attached sheet "Safety instructions and warranty conditions"!

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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 bold-face.

• "Displays" are placed in quotation marks.

1.2. Use for the intended purpose

Opening actuators are used for power operated opening and closing of building coverings, which can be installed in walls and roofs and are used for ventilation of rooms and smoke removal. 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. Functional description

The Folding Arm² is a compact opening actuator, which does not require a spindle, chain or similar actuating element. The two lever arms rotate around the actuator body and thereby move the flanged window element/building cover.

The technical highlights are:

- compatible with SHEV systems
- very large opening angles can be realized

Folding Arm ² short	Folding Arm ²	Folding Arm ² long
EA-KL ² -K-50 / EA-KL ² -K-80	EA-KL ² -50 / EA-KL ² -80 / EA-KL ² -100	EA-KL ² -L
530 mm stroke at 500 N or 800 N force.	710 mm stroke at 500 N, 800 N or 1000 N force.	1200 mm stroke at 550 N force.

- opening time less than 60 seconds⁽¹⁾
- high-performance gearing
- intelligent overload cut-off
 - ♦ electronic stroke
 - ♦ soft start
- intelligent bracket system (enables a flexible installation on main and secondary closing edge)
- parametrisation port (SIMON-LINK)



- low current consumption and high efficiency
- any desired coating possible (RAL, DB)

2. Safety regulations

See the attached sheet "safety instructions and warranty conditions"!

2.1. Risk analysis



INFORMATION

According to the application, carry out a risk analysis (e.g. of the assembled system).

Notes on risk analysis and assembly can be found in the leaflet in the guidance sheet KB.01 'Power operated Windows':

[www.eurowindow.eu/news-and-proceeding/
position-papers-and-publications/](http://www.eurowindow.eu/news-and-proceeding/position-papers-and-publications/)

(1) The declaration is valid under nominal conditions, e.g. rated voltage and/or nominal load.

Figures

3. Figures

Figure 1: Dimensions Folding Arm²

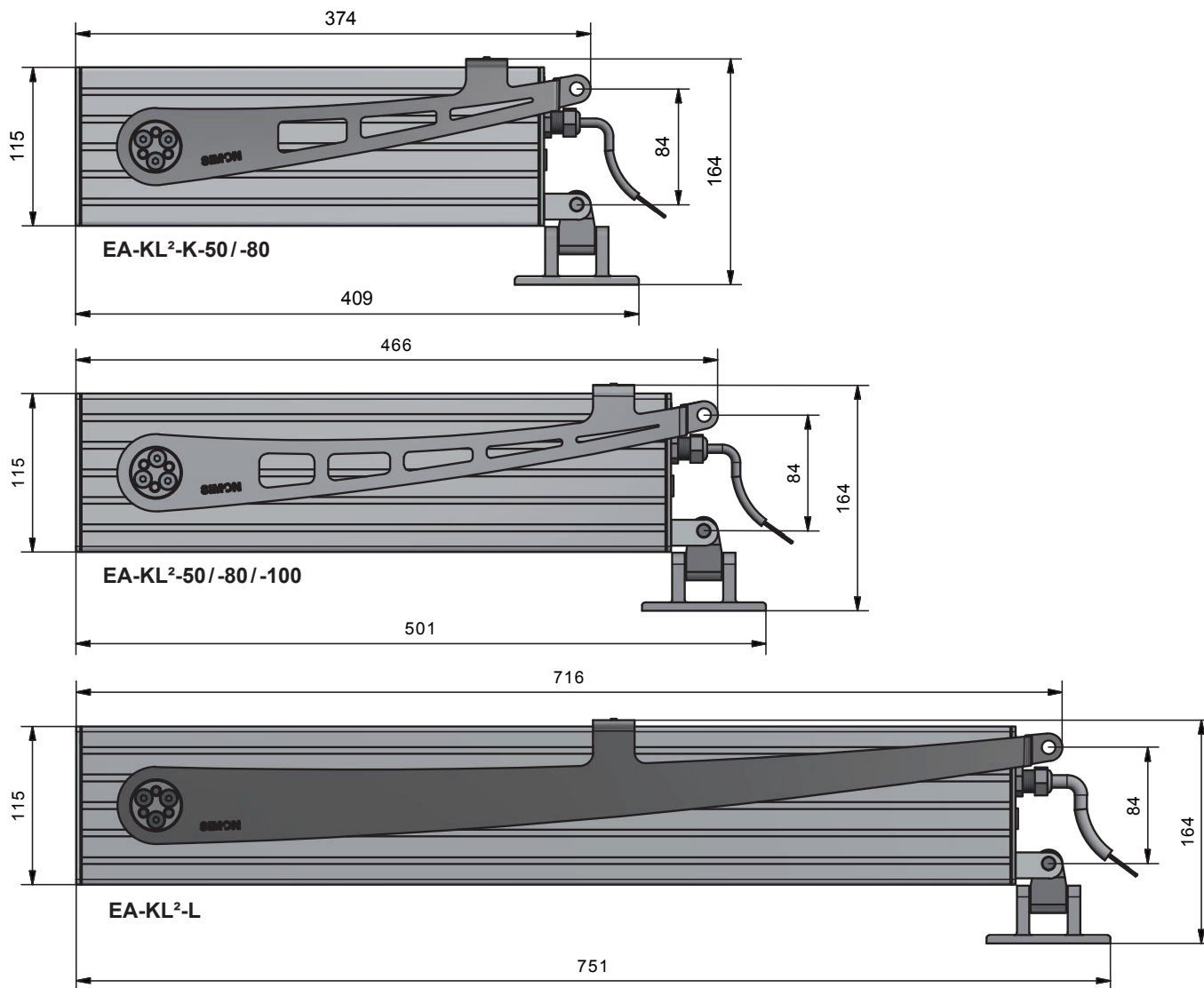


Figure 2: EA-KL²-K-50/-80 opened

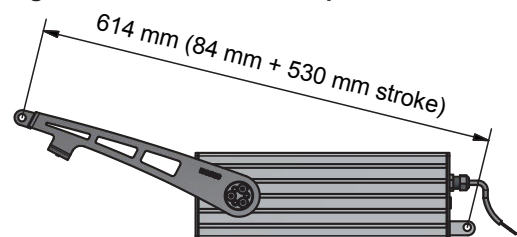


Figure 3: EA-KL²-50/-80/-100 opened

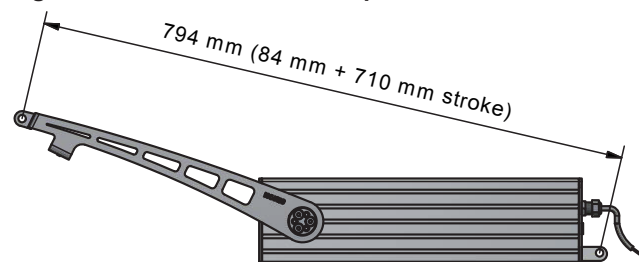
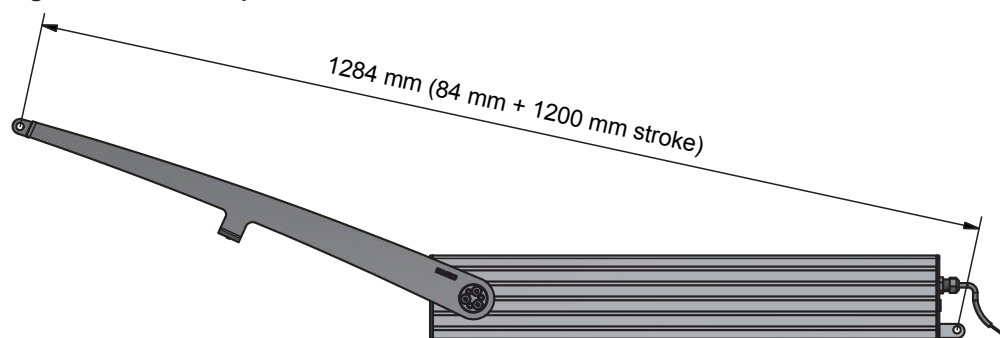


Figure 4: EA-KL²-L opened



Mounting

4. Mounting



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.



Incorrect installation causes the danger of electric shock. Be sure to follow the valid safety rules! Pay attention to the valid installation regulations. Incorrect installation can lead to serious injuries.

4.1. Mechanical connection



ATTENTION

All measurements given in this chapter are minimum specifications and may vary depending on the type and design of the windows.



INFORMATION

For more information on the various bracket kits and installation variants, please visit our website or contact our technical sales department:

www.simon-protec.com



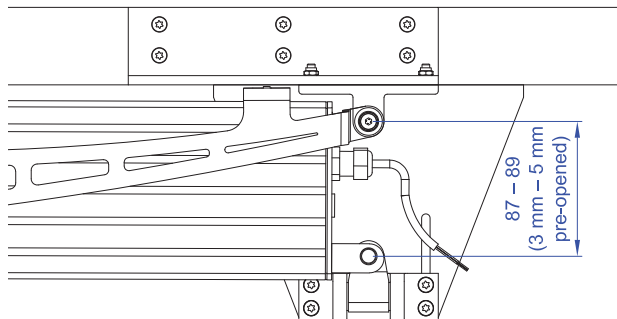
Further information on mounting can be found in the guidance sheet KB.01 'Power operated Windows':

www.eurowindow.eu/news-and-proceeding/position-papers-and-publications/



INFORMATION

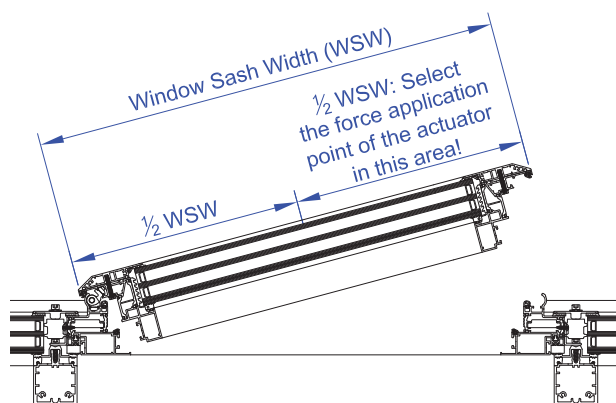
In order to guarantee the sealing of the window, you should always mount the Folding Arm² actuator slightly pre-opened (approx. 3 mm – 5 mm) so that the actuators switch off in the end position of the window:



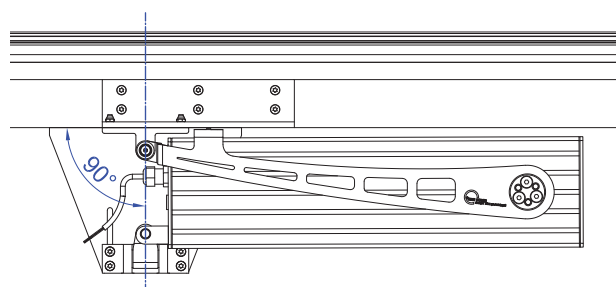
4.1.1. Folding Arm² position at the window



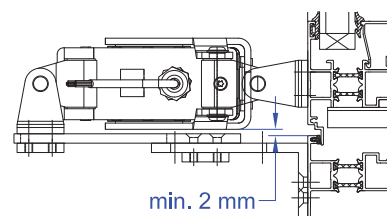
ATTENTION – force application point



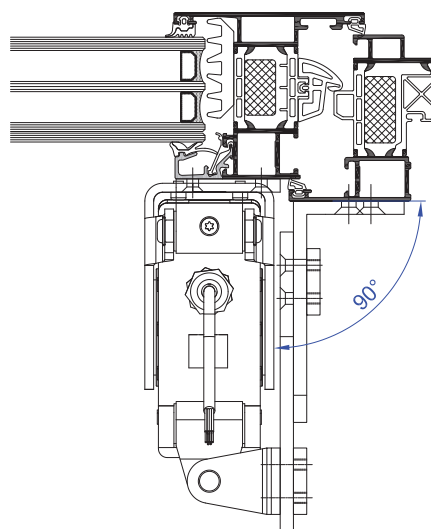
ATTENTION – alignment of the brackets



ATTENTION – distance to the frame



ATTENTION – secondary closing edge (without cardanic bracket)



Mounting

4.1.2. Mount the hinged bracket



ATTENTION

Use only the supplied screws with screw locking!

Figure 5

flange head screw
M5x16

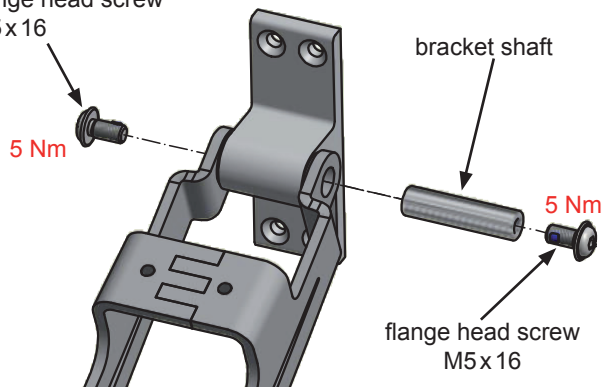
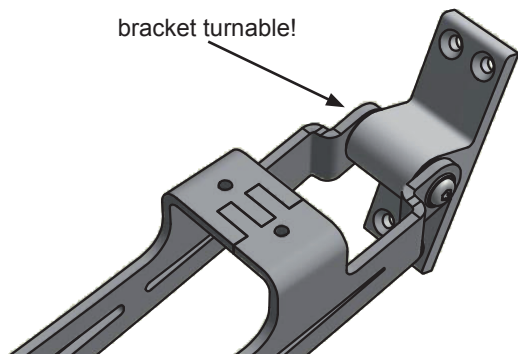


Figure 6

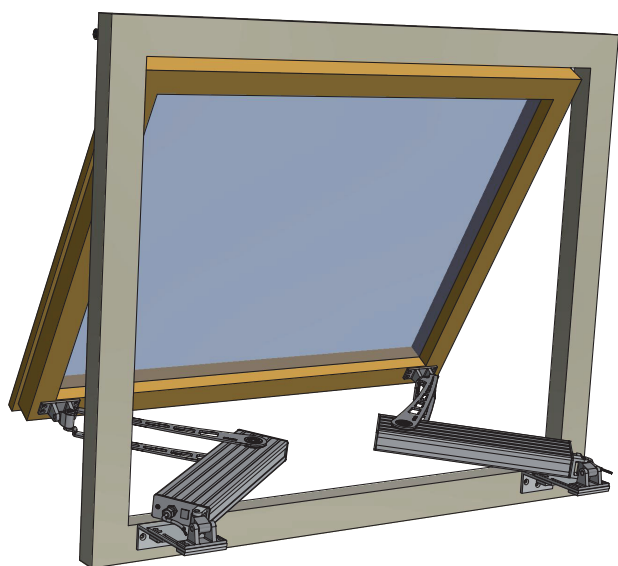
bracket turnable!



4.1.3. Mounting variants

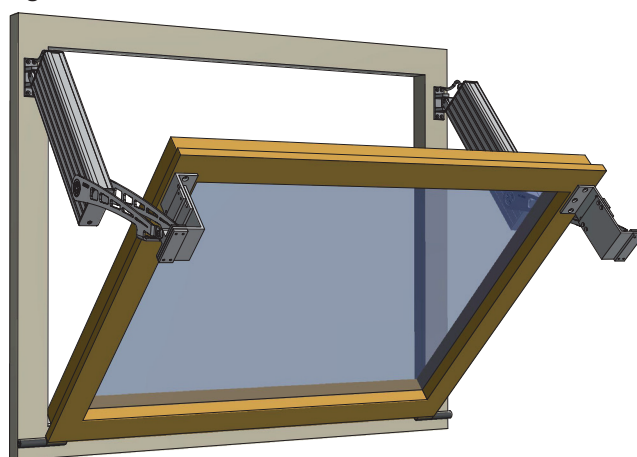
4.1.3.a. Main closing edge – outward opening

Figure 7



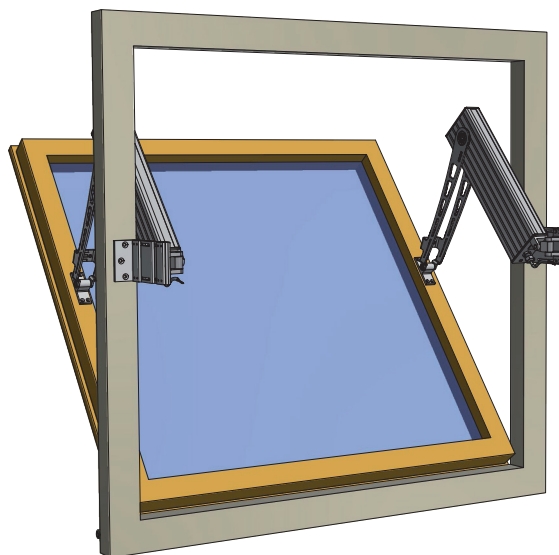
4.1.3.b. Secondary closing edge – inward opening

Figure 8



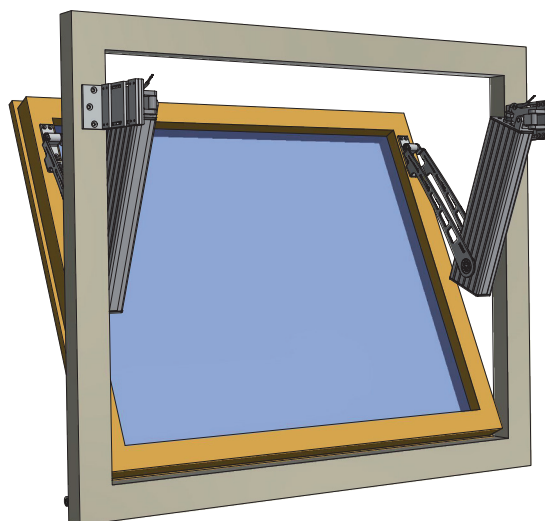
4.1.3.c. Secondary closing edge – outward opening (mounting option A)

Figure 9



4.1.3.d. Secondary closing edge – outward opening (mounting option B)

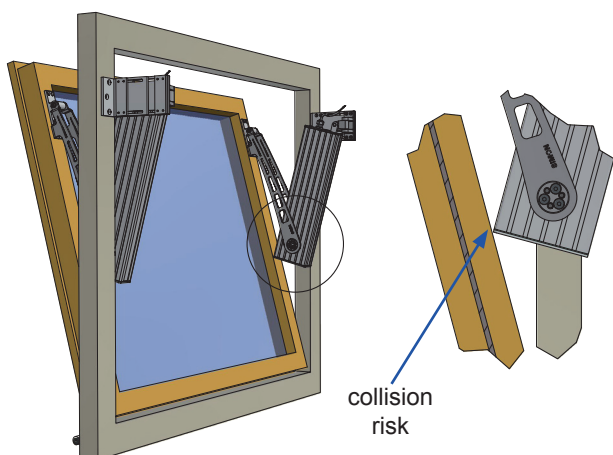
Figure 10



Mounting

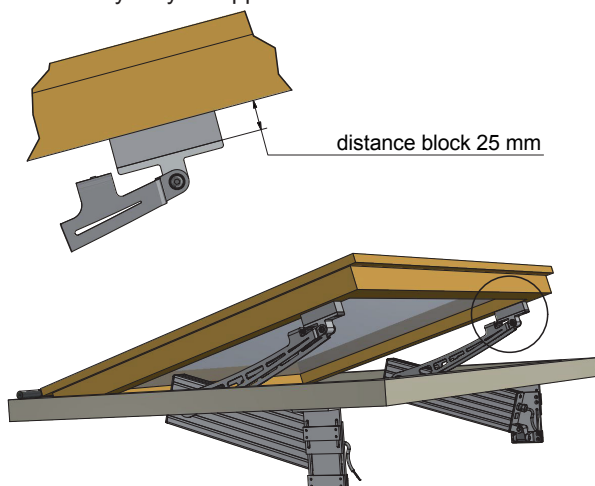


ATTENTION – collision risk



INFORMATION

In case of a collision, spacers (up to 25 mm) are available. Depending on the type of bracket kit and overlap of the window they may be applicable.



4.2. Electrical connection



ATTENTION

Make sure that the loops of the supply line, taking into account the bending radii, are sufficiently dimensioned on moving parts, in order to prevent a clamping or breaking of the connection cable.



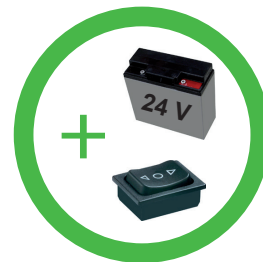
DANGER

Please check the complete system before connecting to the 24 VDC supply.



INFORMATION

We recommend a test run with a suitable mobile power supply (including control unit, no battery alone). This allows a simple and fast reaction to malfunctions.



ATTENTION

Do not earth the electrical connection.

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

Insulate all unused wires.

4.2.1. 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):

$$\text{wire cross-section [mm}^2\text{]} = \frac{\text{single wire length [m]} \times \text{number of actuators} \times \text{power consumption per actuator [A]}}{73}$$

The national regulations are valid.

4.2.2. 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”.

Mounting

4.2.3. Feedback contact – tandem-port



ATTENTION

Exclusively a cut-off signal (e.g. overload cut-off) is relayed to the parallel connected actuators. 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.

4.2.4. Single connection

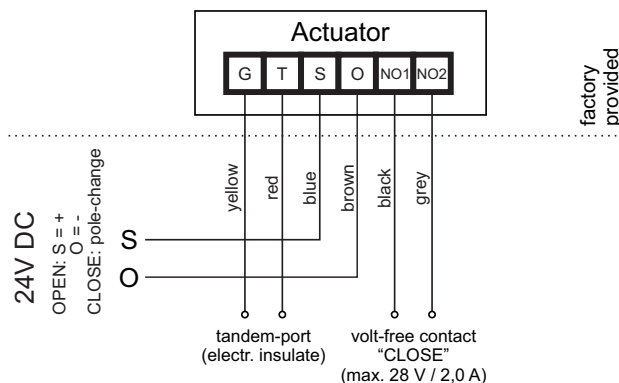


ATTENTION

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

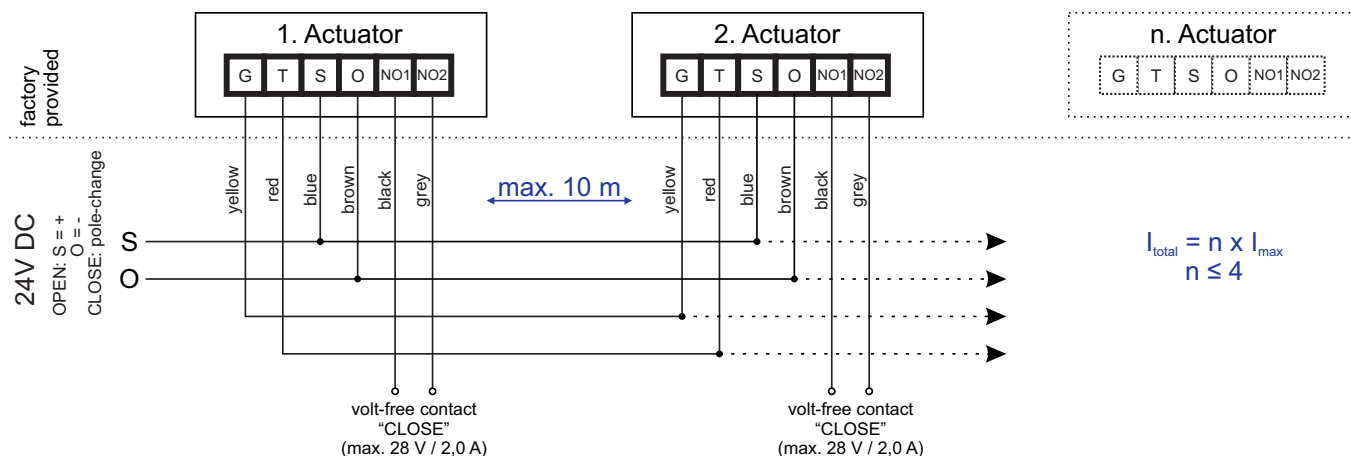
Do not connect red and yellow wires of actuators.

➤ Connect wires according to wiring diagram.



4.2.5. Parallel connection (tandem operation)

➤ Connect wires according to wiring diagram.



4.3. SIMON-LINK



INFORMATION

To set parameters via SIMON-link you need an USB-service-cable and the supporting software (version 2.0 or higher).

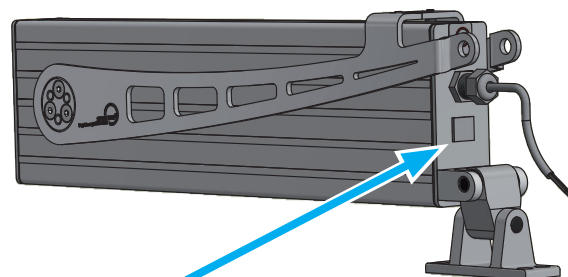
For further information visit

short.simon-protec.com/slen



To read data via SIMON-LINK or to parametrise it, the actuator must be powered externally, ideally in the direction "CLOSE" in end position "CLOSE".

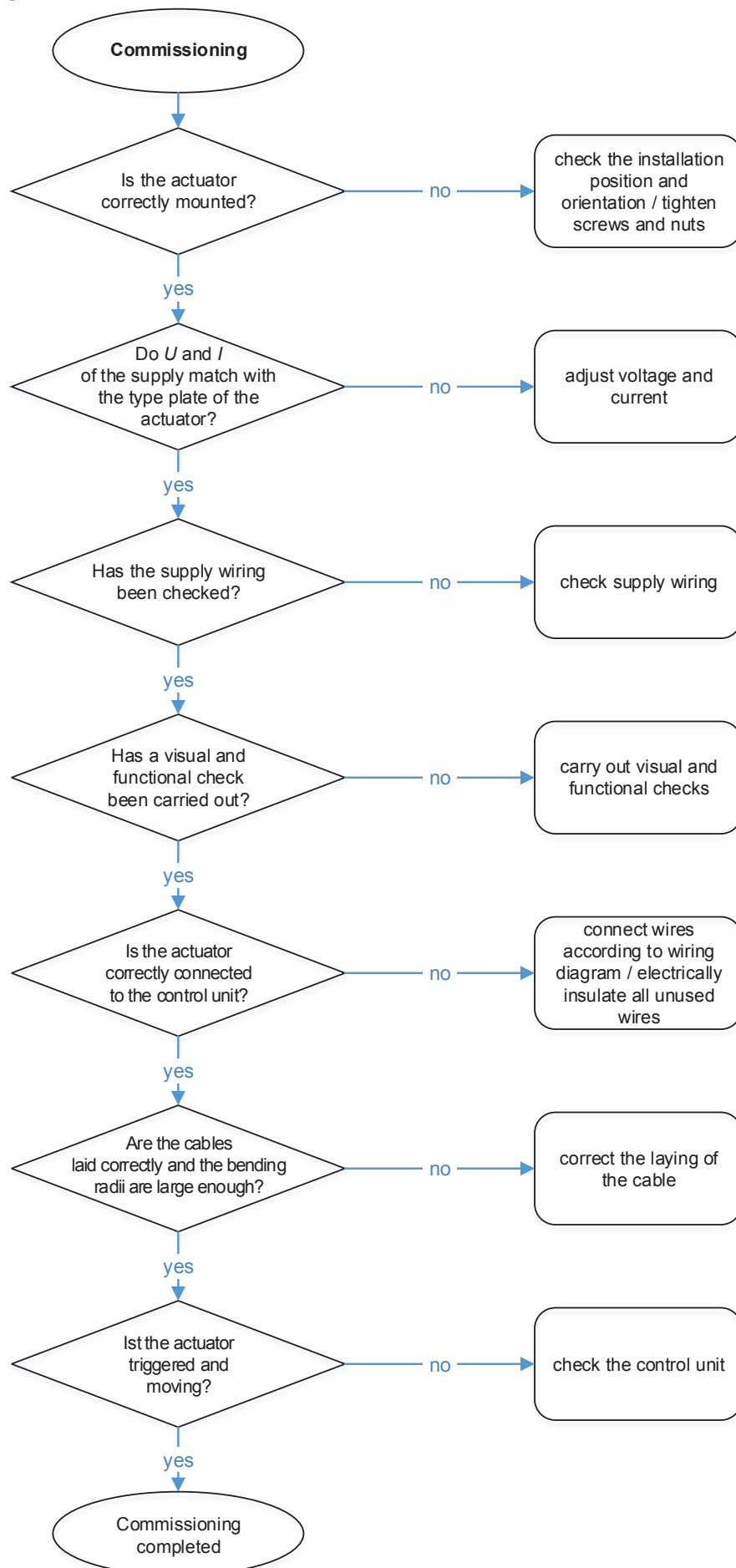
Figure 11: Parametrisation port for SIMON-LINK



parametrisation port – covering

Commissioning

5. Commissioning



Technical data

6. Technical data

Table 1: Electrical characteristics

Actuator type/version	Folding Arm ² short		Folding Arm ²			Folding Arm ² long
	EA-KL ² -K-50	EA-KL ² -K-80	EA-KL ² -50	EA-KL ² -80	EA-KL ² -100	EA-KL ² -L
Rated voltage	24 VDC					
Permissible rated voltage range	24 VDC -15%; +15%					
Ripple of rated voltage V _{pp}	max. 500 mV					
Undervoltage detection	Yes					
Rated current ⁽¹⁾	1.4 A	2.0 A	2.0 A	2.6 A	3.0 A	3.0 A
Maximum starting current "OPEN"	1.54 A	2.2 A	2.2 A	2.9 A	3.3 A	3.3 A
Maximum starting current "CLOSE"	1.54 A	2.2 A	2.2 A	2.0 A	2.0 A	2.0 A
Maximum cut-off current in "OPENING" direction	1.4 A	2.0 A	2.0 A	2.6 A	3.0 A	3.0 A
Maximum cut-off current in "CLOSING" direction	1.4 A	2.0 A	2.0 A	1.7 A	1.7 A	1.7 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 ⁽²⁾	4					
Cable length between two actuators in tandem mode	max. 10 m					
Stopping time ⁽³⁾	3 s					
Pulse time ⁽⁴⁾	320 ms					
Protection class	III					

(1) maximum current consumption with nominal load

(2) with common cut-off function (tandem function)

(3) The stopping time indicates how long the actuators connected in parallel remain powered after the trigger actuator is shut down.

(4) 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	Folding Arm ²
Rated voltage	max. 28 VDC
Relay contact load	2 A



ATTENTION

The maximum contact load must not be exceeded.

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".

Table 3: Connection and operation

Actuator type/version	Folding Arm ² short		Folding Arm ²			Folding Arm ² long
	EA-KL ² -K-50	EA-KL ² -K-80	EA-KL ² -50	EA-KL ² -80	EA-KL ² -100	EA-KL ² -L
Silicone connection cable	6×0.75 mm ²					
Connection cable length ⁽⁵⁾	3.0 m		3.0 m			3.5 m
Pause time during change of direction ⁽⁶⁾	minimum 500 ms					
Switch-on duration	S ₂ ED 30% (short-time duty 3 of 10 minutes)					
Stability of opening and closing cycles	> 11 000					
Sound level ⁽⁷⁾	< 70 dB (A)					
Multiple triggering according to prEN 12101-9	allowed					
Multiple triggering after stop	allowed					
Care	See the attached sheet "safety instructions and warranty conditions"!					

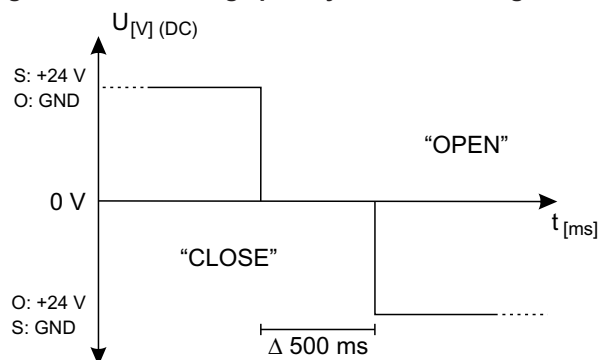
(5) Optional lengths possible.

(6) For the direction change (pole-change), it is necessary that the power supply ensures a pause time (zero-volt range) of at least 500 ms.

(7) Measured at a distance of one metre under normal conditions.

Technical data

Figure 12: Zero-Voltage part by direction change



ATTENTION

Voltage stability/quality: Allowed are only defined switch-off processes (voltage drop from 24 VDC to 0 V in less than 10 ms).

This also applies in particular to switching processes from primary (mains operation) to secondary energy source (emergency power batteries).

Table 4: Mechanical characteristics

Actuator type / version	Folding Arm ² short		Folding Arm ²			Folding Arm ² long
	EA-KL ² -K-50	EA-KL ² -K-80	EA-KL ² -50	EA-KL ² -80	EA-KL ² -100	EA-KL ² -L
Maximum pushing force	500 N	800 N	500 N	800 N	1000 N	550 N
Maximum tractive force ⁽⁸⁾	500 N		500 N			300 N
Condition of loading	opening against nominal load / closing with nominal load support					
Nominal locking force (in OPENING and CLOSING)	700 N		700 N	1200 N		660 N
Nominal stroke ⁽⁹⁾	530 mm		710 mm			1200 mm
Stroke speed with nominal load ⁽¹⁰⁾	14.5 mm/s	13.0 mm/s	14.5 mm/s	13.0 mm/s	11.8 mm/s	21.0 mm/s
Stroke speed with part load ⁽¹¹⁾	350 N – 15.4 mm/s	500 N – 14.8 mm/s	350 N – 15.4 mm/s	500 N – 14.8 mm/s	700 N – 13.9 mm/s	300 N – 23.0 mm/s
Material surface housing lever	aluminium E6 / EV1 stainless steel					
Dimensions (L×B×H) ⁽¹²⁾	409×58×164		501×58×164			751×58×164
Weight	4.1 kg		4.6 kg	5.5 kg		7.6 kg

(8) Optionally, other values are possible!

(9) The nominal stroke can deviate by $\pm 5\%$ due to mechanical damping.

(10) In relation to a stroke of 530 mm / 710 mm / 1200 mm stroke; tolerance $\pm 5\%$.

(11) In relation to a stroke of 530 mm / 710 mm / 1200 mm stroke with part load; tolerance $\pm 5\%$.

(12) See figure 1: "Dimensions Folding Arm²" on page 4.

Table 5: Installation and environmental conditions

Actuator type / version	Folding Arm ² short		Folding Arm ²			Folding Arm ² long
	EA-KL ² -K-50	EA-KL ² -K-80	EA-KL ² -50	EA-KL ² -80	EA-KL ² -100	EA-KL ² -L
Rated operating temperature	20 °C					
Permissible ambient temperature range	0 – 75 °C					
Temperature stability (SHEV)	300 °C					
Ingress protection	IP 54 / IP 65 ⁽¹³⁾ / ball impact resistance ⁽¹³⁾ according to DIN 18032-3					
Usage range	Central European environmental conditions ≤ 2000 metres above sea level					

(13) Certified only for EA-KL²-50/-80/-100, analogue version also possible for other Folding Arm² types.

Table 6: Approvals and certificates

Actuator type / version	Folding Arm ² short		Folding Arm ²			Folding Arm ² long
	EA-KL ² -K-50	EA-KL ² -K-80	EA-KL ² -50	EA-KL ² -80	EA-KL ² -100	EA-KL ² -L
CE-compliant	in accordance with EMC directive 2014/30/EU and the low voltage directive 2014/35/EU					
Further approvals	on request					

Table 7: Accessories

Actuator type / version	Folding Arm ² short		Folding Arm ²			Folding Arm ² long
	EA-KL ² -K-50	EA-KL ² -K-80	EA-KL ² -50	EA-KL ² -80	EA-KL ² -100	EA-KL ² -L
Mechanical connection to the actuator	A wide selection of bracket kits is available. The technical data apply only in conjunction with original accessories!					
Mechanical connection to the actuator housing						

7. Care and maintenance

See the attached sheet “safety instructions and warranty conditions”!

short.simon-protec.com/sugen.



8. Appendix

8.1. General business and delivery terms

Deliveries and services are subject to the currently applicable terms for products and services of the electrical industry (green delivery terms), including the supplementary clause “Extended retention of title”. These are published by the German Electrical and Electronic Manufacturers’ Association (ZVEI), Frankfurt. If you are not aware of these, we will gladly send them to you. You can also download these agreements from

short.simon-protec.com/agben.



The place of jurisdiction is Passau.

8.2. Manufacturer’s declaration

CE We hereby declare that the product complies with the applicable directives. The declaration of conformity can be read at the company’s premises and will be sent to you upon request. This declaration certifies that the product complies with the mentioned directives, but does not represent any guarantee of the product’s features. This declaration loses its validity, if the product is modified without seeking our prior authorisation.

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. System manufacturer

SIMON PROtec Systems GmbH
Medienstraße 8
D – 94036 Passau

Tel.: +49 (0) 851 988 70-0
Fax: +49 (0) 851 988 70-70

E-Mail: info@simon-protec.com
Internet: www.simon-protec.com

8.4.2. Germany

SIMON PROtec Deutschland GmbH
Medienstraße 8
D – 94036 Passau

Tel.: +49 (0) 851 379 368-0
Fax: +49 (0) 851 379 368-70

SIMON PROtec Deutschland GmbH
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D – 82061 Neuried

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E-Mail: info@simon-protec.de
Internet: www.simon-protec.de

8.4.3. Switzerland

SIMON PROtec Systems AG
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CH – 8320 Fehraltorf

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Fax: +41 (0) 44 956 50 40

E-Mail: info@simon-protec.ch
Internet: www.simon-protec.ch

8.4.4. Hungary

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Internet: www.simon-protec.hu