

PA-KL²-K (530) PA-KL² (710) PA-KL²-M (960) PA-KL²-L (1200)

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[short.simon-protec.com/
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SIC

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ATTENTION

Actuators of the PA-KL² series are not compatible with actuators of the EA-KL² series!

SIMON PROtec Systems GmbH • Medienstraße 8 • D-94036 Passau
☎ +49 (0) 851 988 70-0 • 📠 +49 (0) 851 988 70-70 • info@simon-protec.com • www.simon-protec.com



**These operating instructions are only valid with the supplied
supplementary sheet „Safety instructions and Warranty conditions“!**

Mounting

1. Mounting

1.1. Mechanical connection



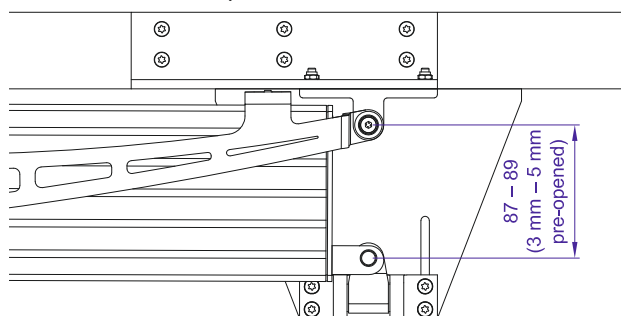
ATTENTION

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



INFORMATION

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



1.1.1. Folding Arm² position at the window

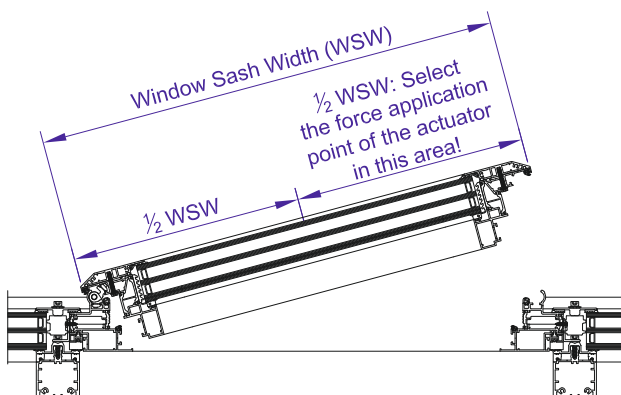


INFORMATION

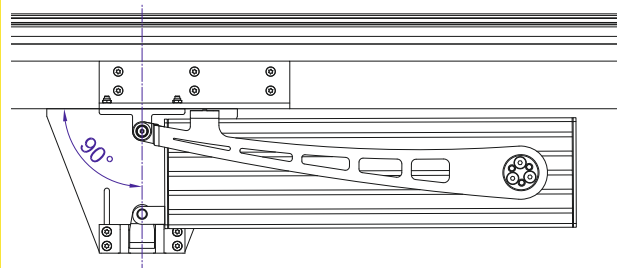
Additional information regarding opening angles in different mounting situations can be found in the Technical Detail "Folding Arm² – Window Opening Angles" on our product website.



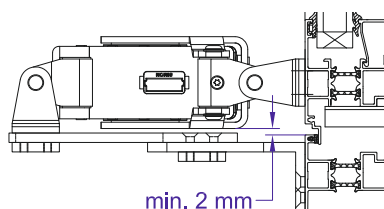
ATTENTION – force application point



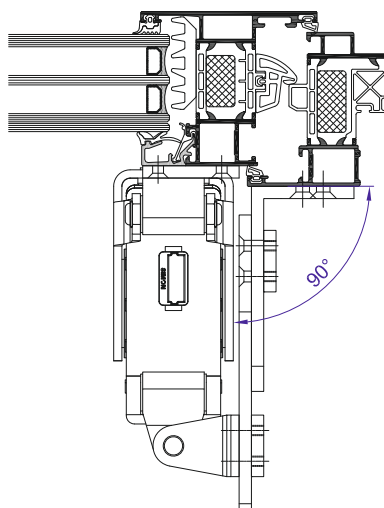
ATTENTION – alignment of the brackets



ATTENTION – distance to the frame



ATTENTION – secondary closing edge (without cardanic bracket)

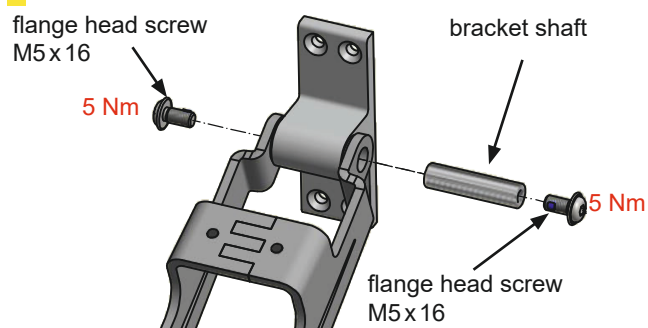


1.1.2. Mount the hinged bracket

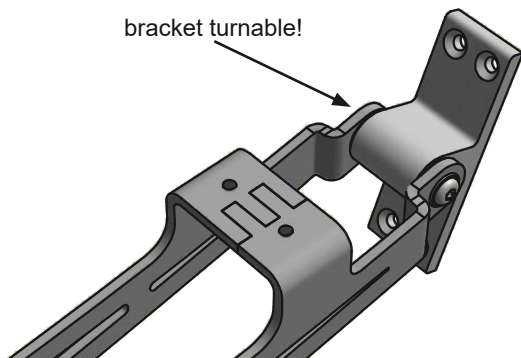


ATTENTION

Use only the supplied screws with screw locking!

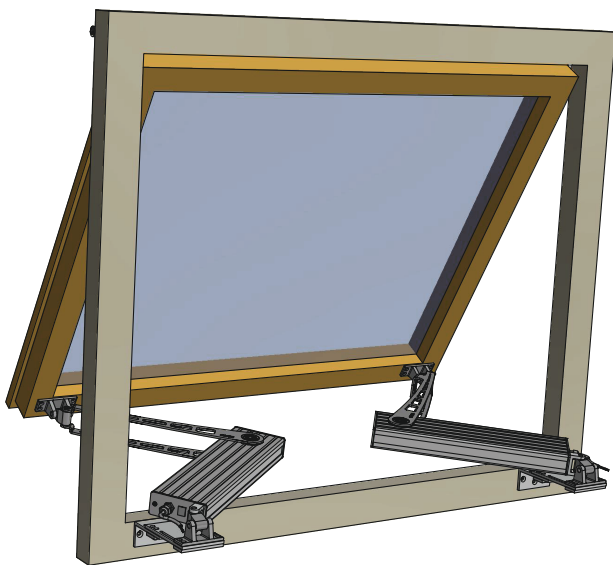


Mounting

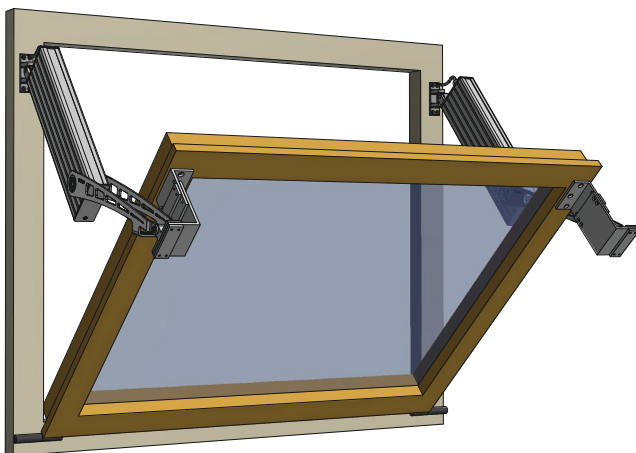


1.1.3. Mounting variants

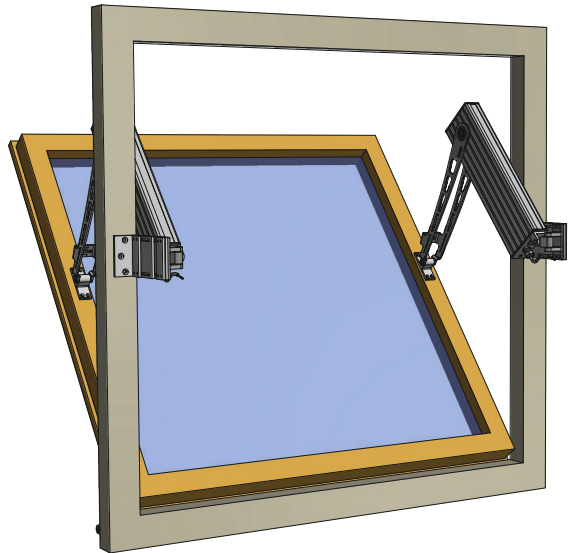
1.1.3.a. Main closing edge – outward opening



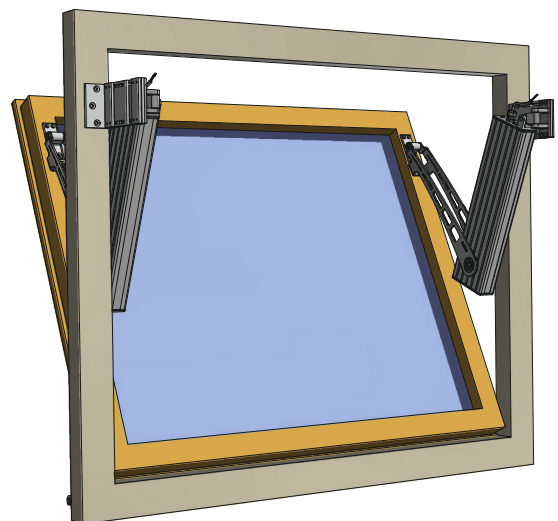
1.1.3.b. Secondary closing edge – inward opening



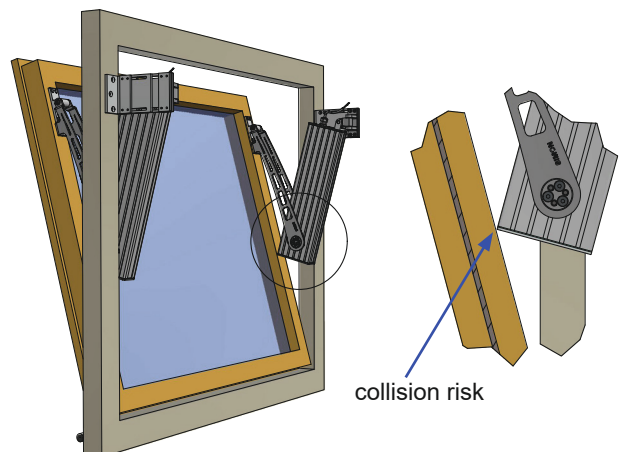
1.1.3.c. Secondary closing edge – outward opening (mounting option A)



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



ATTENTION – collision risk

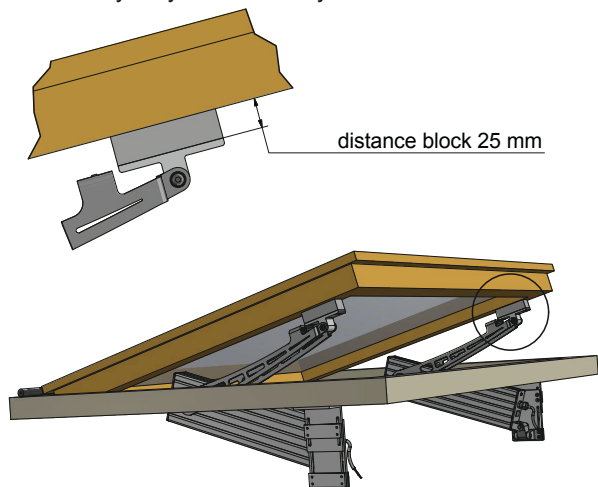


Mounting



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 necessary.



1.2. Electrical connection

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



ATTENTION

Unused wires must be electrically insulated.

The wires **C1** and **C2** must not be connected to each other during normal operation.

1.2.1. Power supply

The power source must be dimensioned sufficiently for the actuator. Voltage and current must fit the specifications on the type label.

1.2.2. Feedback – volt-free contact

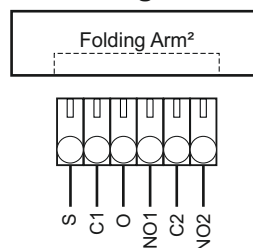
The normally open contact (NO1, NO2) is activated in direction “CLOSE” when the actuator is cut off in end position “CLOSE”. The message is stroke-dependent and can be evaluated as a “CLOSED” message.

1.2.3. Preparation for installation

Before starting the installation, the required connection cable must be assembled. For this purpose use the plug included in the scope of delivery (see instructions in the accessory bag with SICO PLUG). For NSHEV according to EN 12101-2, the silicone connecting cable approved by the manufacturer must be used.

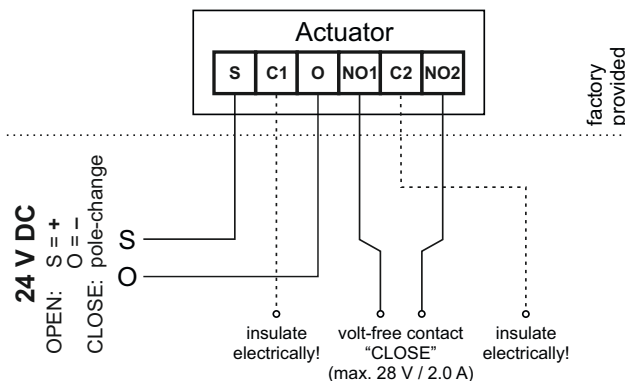


1.2.4. SICO PLUG assignment



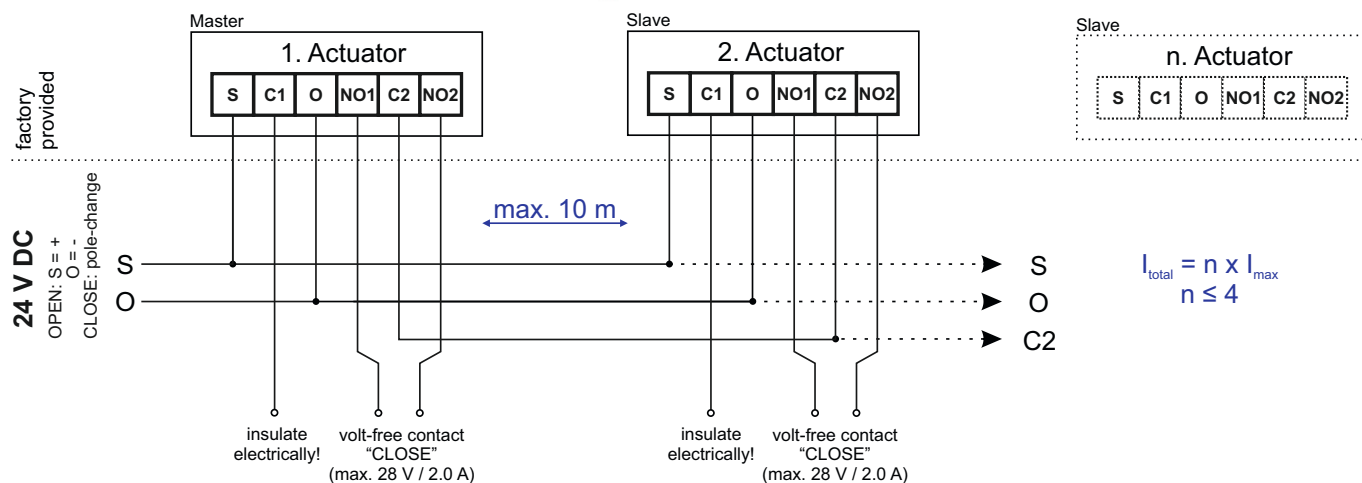
1.2.5. Single operation

- Connect wires according to the the wiring diagram.



1.2.6. Synchronous operation

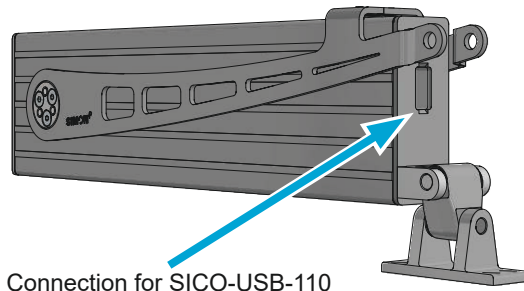
- Connect wires according to the wiring diagram.



1.3. Setting options

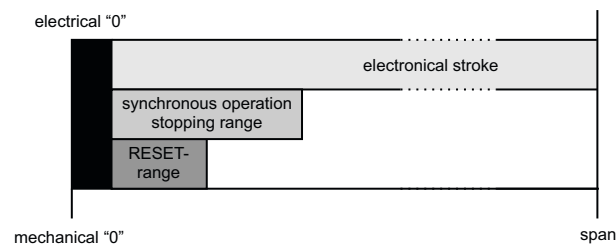
You can set **single operation** or **synchronous operation mode MASTER/SLAVE** via SICO LINK or manually (see chapter 1.4.1)

Figure 1: Interface for SICO LINK



Connection for SICO-USB-110

Figure 2: Stroke behaviour



Actuator type	Folding Arm ²			
	530 PA-KL ² -K	710 PA-KL ²	960 PA-KL ² -M	1200 PA-KL ² -L
RESET-range	16 mm	21 mm	27 mm	34 mm
Synchronous operat. stopping range	32 mm	42 mm	54 mm	68 mm

RESET-range: When the actuator is cut off on overload within the RESET-range, the electronic zero point will be set new.

Synchronous operation stopping range: If an actuator cuts off in synchronous operation in direction CLOSE within the **stopping range**, the remaining actuators continue to run to the zero point until overload cut-off.

1.3.1. Synchronous actuators

The synchronous actuators of the PA-KL² series are identified by the suffix "S" in the part number (e.g. PA-KL²-50/710-S – M2 2001 S).

1.3.2. Zero point/RESET-range

It's necessary to reset the zero point, if the closed position of the actuator is out of the RESET-range after installation. (SICO LINK / RESET-run).



ATTENTION – Span

If the zero point is shifted due to a large pre-opening⁽¹⁾, the maximum span must not be exceeded.

$$\text{span} = \text{pre-opening} + \text{max. stroke}$$

(1) Large pre-opening: Outside the permissible parameters. – Permissible parameters see 1.1.

1.3.3. Operating modes synchronous actuator

If a synchronous actuator is to be used as a single actuator, the operating mode must be set to "Single operation" (SICO LINK or RESET-run) – factory setting.

If several actuators are to be used in synchronous operation, one actuator must be set to "Synchro Master" and the remaining actuators to "Slave" (SICO LINK or manual MASTER/SLAVE setting).



ATTENTION

Actuators may only be synchronized after mounting and only when the lever arm is fully closed!

In order to recalibrate the synchronous function, the actuator must be fully closed in the reset range after max. 50 cycles.

1.4. Manual setting

1.4.1. MASTER/SLAVE setting



ATTENTION

Manual setting: One MASTER and one SLAVE possible.

SICO LINK: ONE MASTER and up to four SLAVES possible.

- Drive the actuator in direction "CLOSE" (S="–" O="+") and let it cut off in the end position. If the actuator does not reach the „mechanical ZERO“ position due to its mounting position, a RESET-run must be performed.
- Leave the actuator energized!
- Connect the wires **C1** and **C2** directly. A relay click can be heard.
 - ♦ After 5 seconds you can hear a relay click, the actuator is set to MASTER with one connected SLAVE. Separate wires.
 - ♦ After 10 seconds a further relay click can be heard, the actuator is now set to SLAVE. Separate wires.
- Disconnect the actuator from power supply!
- Connect the two actuators according to chapter 1.2.6: „Synchronous operation“ on page 5.

1.4.2. RESET-run

A RESET-run should be carried out,

- if the opening width of the closed actuator at the window is outside the RESET-range.
- if the MASTER/SLAVE setting needs to be reset.
- Disconnect the actuator(s) from power supply!
- Connect the wires **C1** and **C2** of each actuator directly with each other.
- Drive each actuator in direction "CLOSE" (S="–" O="+") and let it be cut-off in the end position!
- Again disconnect the actuator(s) from power supply and disconnect the wires **C1** and **C2**!
- The zero point is set.
- In case of "synchro capable" actuators, the operating mode is reset to "single operation" by the RESET-run. In this mode, actuators can be operated standalone.

2. Dimensions

Figure 3: PA-KL²-K 530

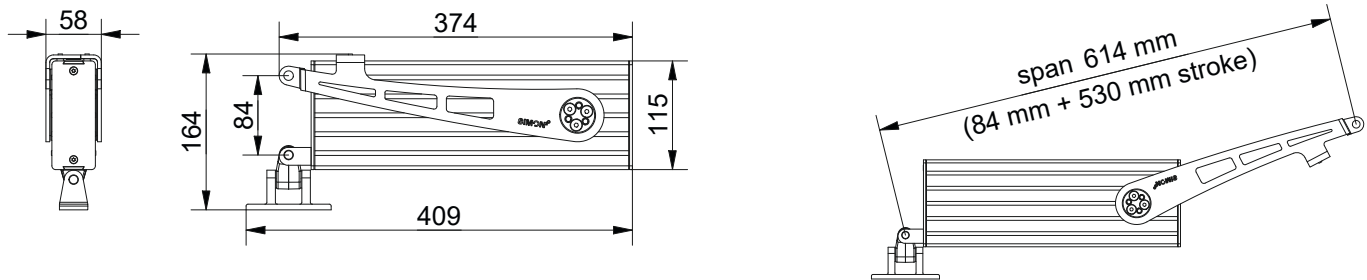


Figure 4: PA-KL² 710

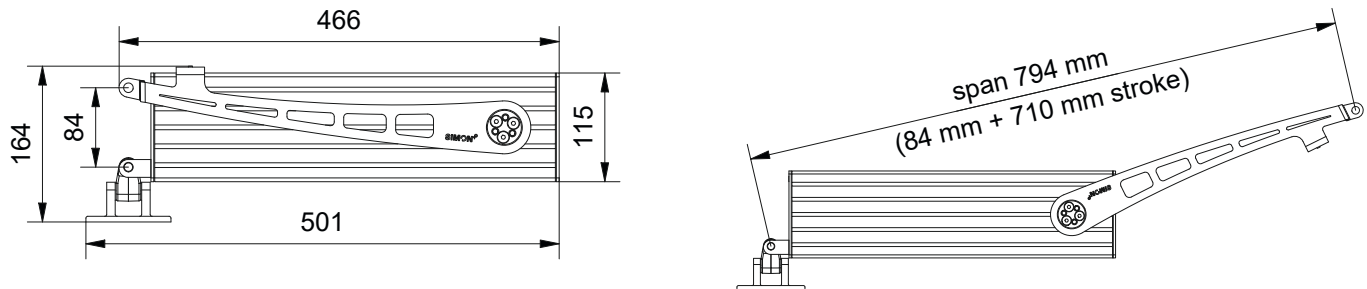


Figure 5: PA-KL²-M 960

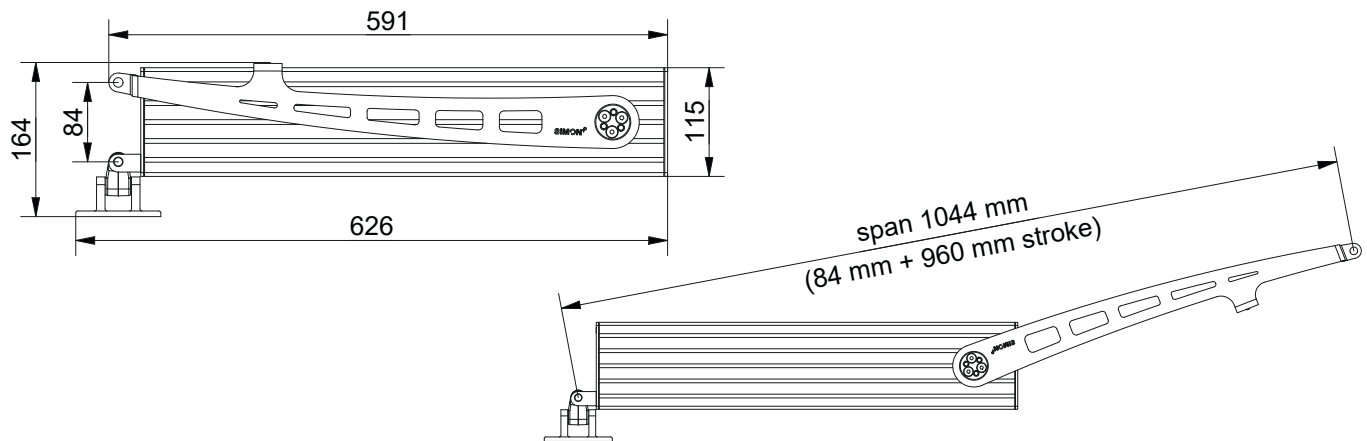
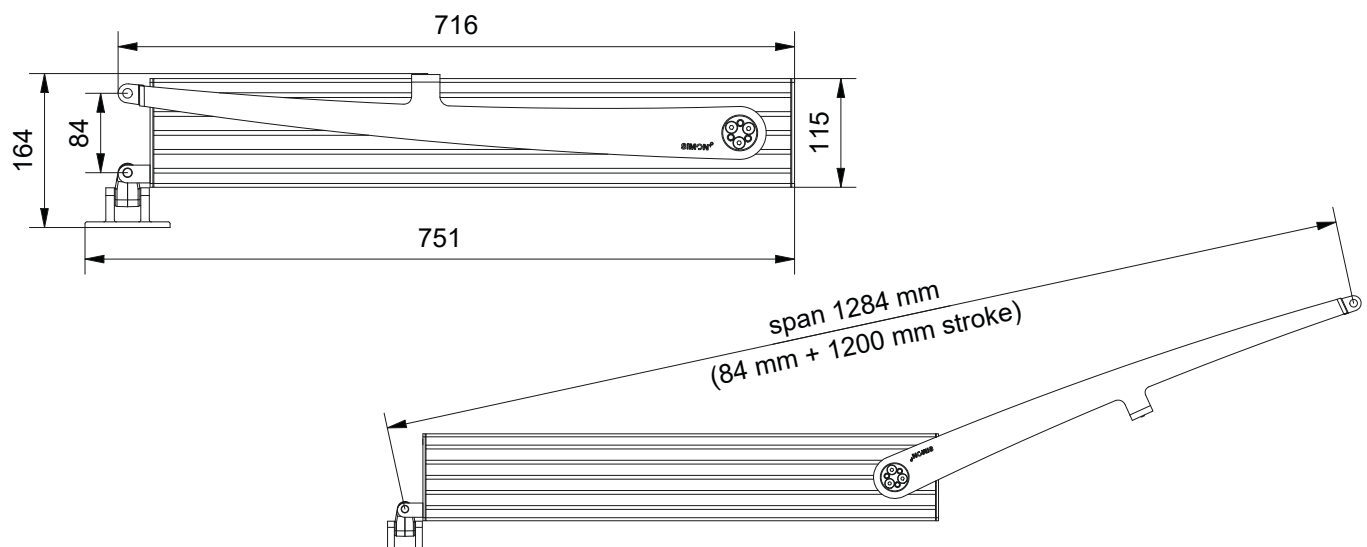


Figure 6: PA-KL²-L 1200



3. Technical data

Table 1: Electrical characteristics

Actuator type	Folding Arm ² 530		Folding Arm ² 710			Folding Arm ² 960	Folding Arm ² 1200
	KL ² -K-50	KL ² -K-80	KL ² -50	KL ² -80	KL ² -100	KL ² -M	KL ² -L
Rated voltage	24 VDC						
Permissible rated voltage range	24 VDC ±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	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	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	2.0 A
Maximum cut-off current in "OPENING" direction ⁽²⁾	1.4 A	2.0 A	2.0 A	2.6 A	3.0 A	3.0 A	3.0 A
Maximum cut-off current in "CLOSING" direction ⁽²⁾	1.4 A	2.0 A	2.0 A	1.7 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 ⁽³⁾	4						
Cable length between two actuators in synchro mode	max. 10 m						
Stopping time ⁽⁴⁾	3 s						
Protection class	III						

(1) Maximum current consumption with nominal load.

(2) Delivery condition, can be parameterized with SICO LINK.

(3) Maximum cable length for bus communication between two actuators.

(4) Within a SICO synchro group the stopping time indicates how long operable actuators are running when one connected actuator fails or cuts off.

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

Actuator type	Folding Arm ²
Rated voltage	max. 28 VDC
Relay contact load	2 A

The normally open contact (NO) is only switched when the actuator is cut off in the "CLOSE" end position. This means that the signal is stroke-dependent and can be evaluated as a "CLOSE signal".



ATTENTION

The maximum contact load must not be exceeded.

Table 3: Connection and operation

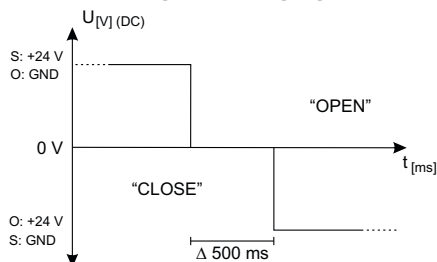
Actuator type	Folding Arm ² 530		Folding Arm ² 710			Folding Arm ² 960	Folding Arm ² 1200
	KL ² -K-50	KL ² -K-80	KL ² -50	KL ² -80	KL ² -100	KL ² -M	KL ² -L
Pause time during change of direction ⁽¹⁾	500 ms						
Switch-on duration	S2 ED 30 % (short-time duty 3 of 10 minutes)						
Stability of opening and closing cycles	> 11 000						
Sound level ⁽²⁾	< 70 dB (A)						
Deadlock according to prEN 12101-9/ISO 21927-9	allowed						
Multiple triggering after stop	allowed						
Maintenance	See the attached sheet "safety instructions and warranty conditions"!						

(1) 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.

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

Technical data

Figure 7: Zero-volt range at changing of direction.



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	Folding Arm² 530		Folding Arm² 710			Folding Arm² 960	Folding Arm² 1200
	KL²-K-50	KL²-K-80	KL²-50	KL²-80	KL²-100	KL²-M	KL²-L
Maximum pushing force ⁽¹⁾	500 N	800 N	500 N	800 N	1000 N	750 N	550 N
Maximum tractive force ⁽¹⁾	500 N		500 N			450 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 ⁽²⁾		900 N ⁽²⁾	660 N ⁽²⁾
Nominal stroke ⁽³⁾	530 mm		710 mm			960 mm	1200 mm
Speed with nominal load – single operation ⁽⁵⁾	14.5 mm/s	13.0 mm/s	14.5 mm/s	13.0 mm/s	11.8 mm/s	14.3 mm/s	21.0 mm/s
Speed with part load ⁽⁶⁾	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	450 N – 17.8 mm/s	300 N – 23.0 mm/s
Material surface housing lever	aluminium E6/ EV1 stainless steel						
Dimensions (L×W×H) ⁽⁷⁾	409×58×164 mm		501×58×164 mm			626×58×164 mm	751×58×164 mm
Weight	4.1 kg		4.6 kg	5.5 kg		6.3 kg	7.6 kg

(1) Optionally, other values are possible!

(2) For small opening widths, the nominal holding force is reduced by 15 %.
(< 30° – Folding Arm² 710: 203 mm stroke / Folding Arm² 960: 268 mm stroke / Folding Arm² 1200: 332 mm stroke)

(3) The nominal stroke can deviate by ±5% due to mechanical damping.

(4) SHEV stroke: Reached stroke under full load after 60 s.

(5) In relation to the nominal stroke; tolerance ±5%.

(6) In relation to a stroke of 530 mm / 710 mm / 960 mm / 1200 mm stroke with part load; tolerance ±5%.

(7) See 2.

Table 5: Installation and environmental conditions

Actuator type	Folding Arm ² 530		Folding Arm ² 710			Folding Arm ² 960	Folding Arm ² 1200
	KL ² -K-50	KL ² -K-80	KL ² -50	KL ² -80	KL ² -100	KL ² -M	KL ² -L
Rated operating temperature	20 °C						
Permissible ambient temperature range	0 – 75 °C						
Max. of permissible heat exposure	300 °C						
Protection class	IP 54 ⁽¹⁾ / ball impact resistance ⁽²⁾ according to DIN 18032-3						
Usage range	Central European environmental conditions ≤ 2000 metres above sea level						

(1) Mounting position permissible up to max. 45° against the vertical.
Other IP protection class possible after consultation with the manufacturer.

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

Table 6: Approvals and certificates

Actuator type	Folding Arm ² 530		Folding Arm ² 710			Folding Arm ² 960	Folding Arm ² 1200
	KL ² -K-50	KL ² -K-80	KL ² -50	KL ² -80	KL ² -100	KL ² -M	KL ² -L
CE-compliant	in accordance with EMC directive 2014/30/EU and the low voltage directive 2014/35/EU						
Safety of electrical appliances	according to EN 60335-1:2012/A11:2014 and EN 60335-2-103:105						
Further approvals	on request (e.g. NSHEV according to EN 12101-2)						