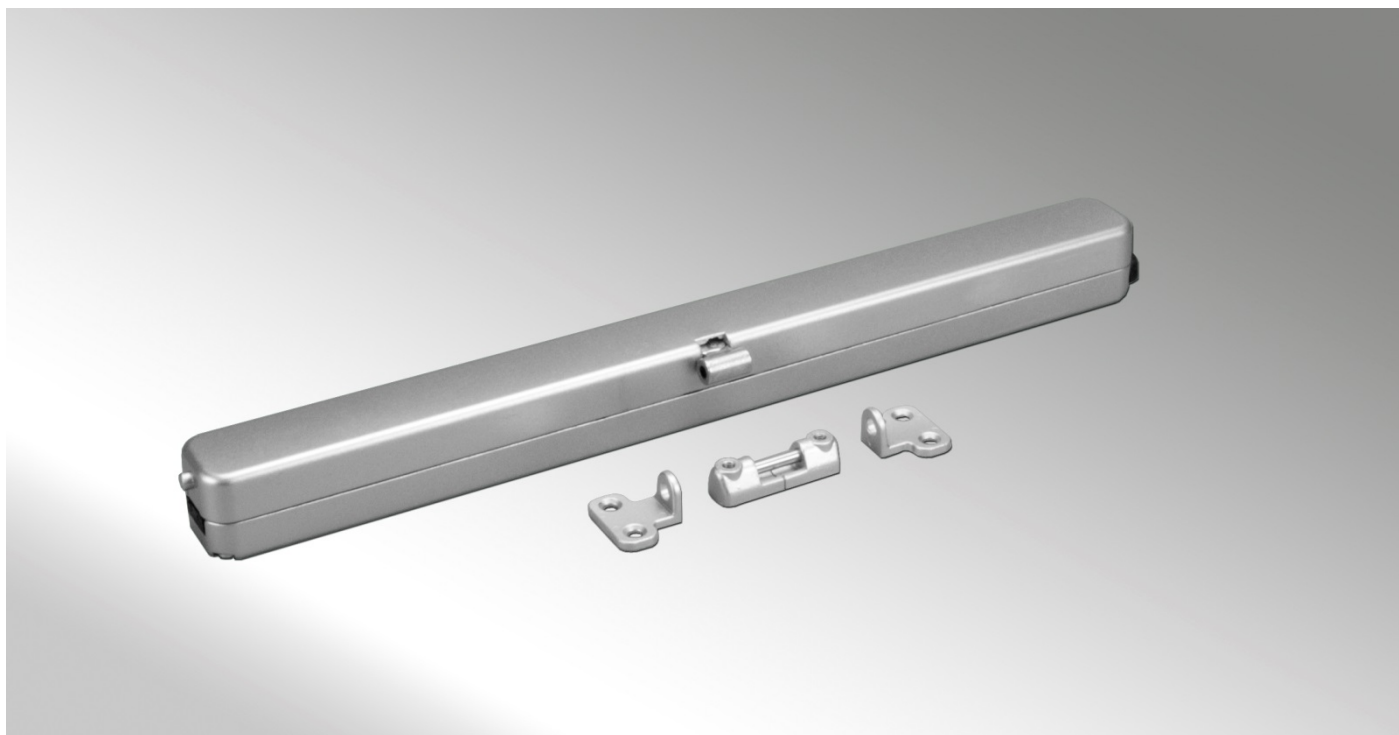


# **CHAIN ACTUATOR — EA-KN-20-XS**

**FORCE 150 N – MAXIMUM STROKE 210 MM**  
**VOLTAGE: 24V = (DC)**



**MANUAL FOR INSTALLATION AND USE**



English



**SIMON RWA-Systems** products are specially manufactured in safe materials in compliance with the requirements of legislation in force. When correctly mounted, installed and used in accordance with the present instructions, our products constitute no danger to people, animals or property.

Products subject to EU directives comply with the essential requirements stipulated by the latter. **CE** markings mean that our products can be sold and installed throughout the European Union without any further formality.

The **CE** mark on our products, packaging and user manuals provided with the product, indicate “presumed in conformity with directives” issued by the EU.

### **Symbols used in the manual**



#### **DANGER**

*This indication draw the attention about potential dangers for safety and health of peoples and animals.*



#### **INFORMATION**

*This information give further suggestions.*



#### **ATTENTION**

*This indication draw the attention about potential dangers for the product itself.*



#### **WARNING**

*This indication draw the attention about potential damages to goods.*



#### **ENVIRONMENTAL INSTRUCTION**

*Environmental indication draw the attention about potential dangers for the environment.*

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# 1. Safety indications



**ATTENTION** BEFORE INSTALLING THIS APPLIANCE, ENSURE ALL SAFETY INDICATIONS HAVE BEEN READ CAREFULLY AND UNDERSTOOD IN ORDER TO PREVENT CONTACT WITH ELECTRICITY, INJURY OR ANY OTHER INCIDENT. THE MANUAL SHOULD BE CONSERVED FOR FURTHER CONSULTATION AT A LATER DATE.

EA-KN-20-XS chain actuators have been designed to move windows or similar.

**Use for any applications other than those indicated must be authorised by the manufacturer after technical review of the assembly.**

To guarantee safety to people, animals and goods, the following indications should be observed carefully.



*The appliance must be installed by competent and qualified technical personnel.*



*After removing packaging, check for any damage on the appliance.*



*Plastic bags, polystyrene, small metal parts such as nails, staples etc should be placed out of the reach of children as they constitute a potential source of risk.*



*Keep children, disabled individuals and animals away from the window and its controls.*



*Before connecting the appliance, check that the power supply has the same specifications as those indicated on the technical data label on the appliance.*



*This machine is destined exclusively for the use for which it has been designed and the manufacturer accepts no responsibility for damage incurred by improper use.*



*The actuator is destined exclusively for installation indoors. For any special application we recommend you consult the manufacturer beforehand.*



*To ensure efficient separation from the grid, an approved type of bipolar pulse switch should be used. An omnipolar general power switch with minimum distance of 3 mm between contacts should be installed upstream of the control line.*



*Do not use solvents or jets of water to wash the appliance. The appliance should not be submerged in water.*



*Repairs should only be performed by qualified personnel at assistance centres authorised by the manufacturer.*



*Always request exclusive use of original spare parts. Failure to respect this condition could compromise safety and invalidate the benefits contained in the warranty for the appliance.*



*In the event of any problems or queries, consult your agent or contact the manufacturer directly.*

## ATTENTION



*With bottom hung windows injury could be caused if the window accidentally falls. An appropriately sized flexible link arm or fall prevention safety system designed to resist a force equal to at least three times the total weight of the window **MUST** be installed.*



*Check that the selected stroke-end allows the window to open without encountering any obstacles whatsoever.*



*The actuator must be installed in accordance with the manufacturer's instructions. Failure to respect these instructions could compromise safety. Power supply installation must comply with any regulations in force.*



*Danger of crushing or dragging. During function, when the actuator closes the window, a force of 230N is exerted on the bead of the frame, enough to crush fingers in the event of distraction.*



*Ensure that the stroke-end selection is less than one centimetre from mechanical stop blocks, stroke limiters or any physical obstacles blocking opening of the sash.*



*In the event of breakage or malfunction, switch the appliance off at the general switch and call for the services of a qualified technician.*

## 2. Technical operating information

The chain actuator is used to open and close the window by means of a three-link steel chain. The movement is achieved with low-voltage (24V DC) electricity that powers a gear motor controlled by a functional electronic device.

Window opening can be programmed, and the device allows excursion of the chain to strokes of 70, 125, 170 and 210 mm. For the return stroke, i.e., the closing of the window, the stroke-end is determined by an electronic process that automatically calculates the required power absorption to produce the movement of the window, and therefore no settings are required.

The actuator can also be installed without the immediate availability of electricity for window movement; in this case the actuator will simply hold the window closed after assembly.

The structure of the actuator is entirely metal, and it is also used for installation on heat and smoke exhaust systems as well as for room ventilation.

The coupling between the actuator and support brackets fixed to the window frame is a quick-connect coupling that allows the actuator to rotate in order to adapt to the stroke of the chain, even on windows with reduced height. The brackets are fixed to the frame during actuator assembly with just two screws.

Combined with the **B-Lock** product and perimeter fittings, it constitutes the security lock that keeps the window closed tight and guarantees a high thermal K.

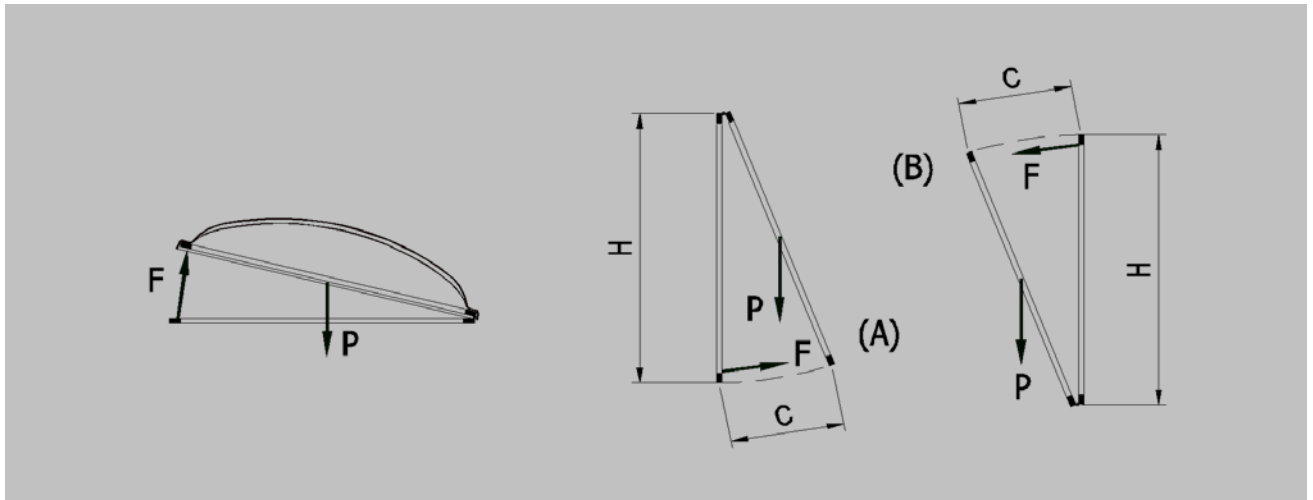
### 3. Formulas and recommendations for installation

#### 3.1. Calculation of opening / closure force

Using the formulas on this page, approximate calculations can be made for the force required to open or close the window considering all the factors that determine the calculation.

*Symbols used for the calculation*

F (kg) = Force for opening or closing	P (kg) = Weight of the window (mobile sash only)
C (cm) = Opening stroke (actuator stroke)	H (cm) = Height of the mobile sash



#### For horizontal light domes or skylights

$$F = 0,54 \times P$$

*(Eventual weight of snow or wind on the cupola should be calculated separately).*

#### For vertical windows

- TOP HUNG WINDOWS, OUTWARD OPENING (A)
- BOTTOM HUNG WINDOWS (B)

$$F = 0,54 \times P \times C : H$$

*(Eventual load of favourable or unfavourable wind on the sash should be calculated separately.)*

#### 3.2. Maximum opening based on sash height

The selection of the actuator stroke should be made based on the height of the sash and its application. As a general rule, never select a stroke greater than the height of the window frame; select the stroke directly below it.



**WARNING.** *The actuator is designed to be recess mounted on the window frame.*

*Check that during the stroke the chain does not touch the profile of the sash, there are no obstacles to opening the window and the chain does not push against the window frame.*

## 4. Technical data

Model	EA-KN-20-XS – 24V
Force exerted by thrust and traction	150N
Strokes ( <i>can be selected at any time</i> )	70, 125, 170, 210 mm
Power supply voltage	24 V DC =
Rated absorbed current	0,32 A
Power absorbed at nominal load	7,5 W
No load speed	8 mm/s
Duration of no load stroke ( <i>210 mm</i> )	27 s
Type of service	S <sub>2</sub> of 3 min
Operating temperature	- 5 + 65 °C
Protection index for electrical devices	IP32
Adjustment of connection to window frame	Automatic definition of position
Parallel powering of two or more motors	YES ( <i>max 20 actuators</i> )
Operation with B-LOCK electromechanical lock	Yes
Synchronised function	Not foreseen
Static hold force	1.000 N
Stroke-end at opening	Electronic by dip-switch
Stroke-end at closing	At absorption of power
Chain exit	Central
Length of power cable	2 m
Dimensions	28x28x310 mm
Weight	0.720 kg

*The data indicated in these figures is not binding and is subject to variation without notification.*

## 5. Construction and regulatory references

The EA-KN-20-XS chain actuator is designed and built to open and close top-hung windows opening outwards, bottom-hung windows or up-and-over roof windows. Its use is specifically intended for ventilation, air conditioning of rooms, smoke and heat exhaust systems and, if used in combination with the B-Lock window lock, also as a building security system; it is highly recommended that the actuator not be used for any other purpose unless approved by the manufacturer beforehand.

Electrical connections must comply with standards in force on the design and production of electrical appliances.

The actuator has been manufactured according to European Union directives and conforms to CE marking and following EMC rules for interference.

Any eventual service or control device for the actuator must be produced according to standards in force and must comply with the standards issued by the European Community.



The actuator is individually packaged in a cardboard container and each pack contains:

- 24V= electrical actuator complete of connector for feeding cable wiring.

- 2 support brackets

- 2 half-brackets for attach to the frame, complete with pin



- Instruction manual



## 6. Id plate and marking data

All actuators have **CE** marking and are destined for use in the European Union without further requirements.

The **CE** marking on the product, packaging and indications for use provided with the product indicate 'presumed conformity to the directives' issued by the European Community.

## 7. Electric power supply

The EA-KN-20-XS actuator is powered with a voltage of 24V (DC). The power supply cable has three conductors: the first conductor **BLACK "1"** that should be connected to the + (positive) **CLOSES** the window; the second conductor **Black "2"** that should be connected to the + (positive) **OPENS** the window; the third conductor **Black "3"** is the conductor used for the B-Lock control communication signal.

The 24V low-voltage actuators can be powered using a station with emergency batteries or an approved class II power supply unit (*double safety insulation*) with an output voltage of 24V (-15% ÷ +15%, in other words *min. 20.4V, max. 27.6V*), that is to say, sized based on the number of actuators connected. The EA-KN-20-XS power supply must be suitably protected by fuses.

## 7.1. Selecting the cross-section of the power supply cables

With the 24V (DC) power supply, it is necessary to check the cross-section of the cable, which should be calculated based on the length of the cable itself. The table below specifies the maximum length of the cables for connection of a motor.

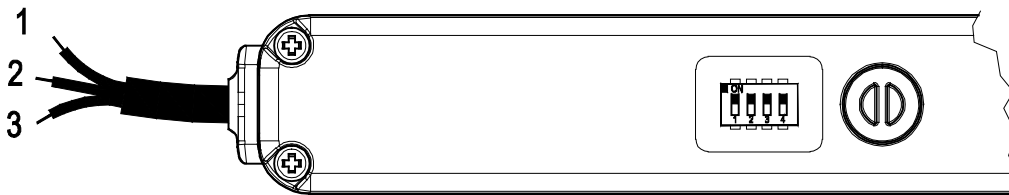
Cable section	Max cable length
4,00 mm <sup>2</sup>	~ 270 m
2,50 mm <sup>2</sup>	~ 170 m
1,50 mm <sup>2</sup>	~ 100 m
0,75 mm <sup>2</sup>	~ 50 m
0,50 mm <sup>2</sup>	~ 35 m

## 8. Electrical connection

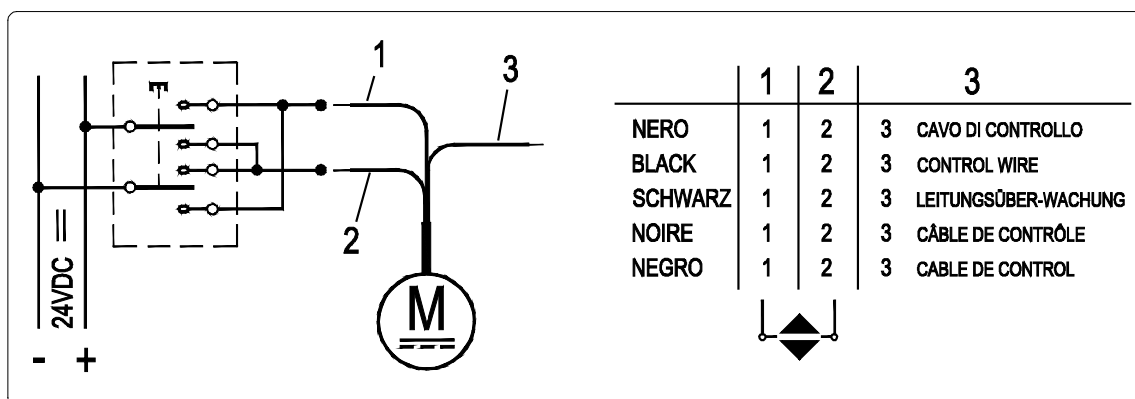
The machines are equipped with a power supply cable constructed in compliance with safety standards and restrictions on radio-frequency interference.

The power supply cable - with conductors having a cross-section of 0.5 mm<sup>2</sup> - must be wired to a special connector as shown in the diagram below, in the following sequence:

- 1 – BLACK-coloured conductor, marked “1”;
- 2 – BLACK-coloured conductor, marked “2”;
- 3 – BLACK-coloured conductor, marked “3”:



For harness, please follow this diagram:



*Note: the first conductor **BLACK** “1” that should be connected to the + (positive) CLOSES the window; the second conductor **Black** “2” that should be connected to the + (positive) OPENS the window; the third conductor **Black** “3” is the conductor used for the B-Lock control communication signal.*

## 9. Instructions for assembly

***These indications are for specialised technical personnel and basic work and safety techniques are not indicated.***

All preparatory, assembly and electrical connection operations must be performed by specialised technical personnel to guarantee optimal function and service of the actuator. Check that the following fundamental conditions have been met:



Actuator specifications must be sufficient for movement of the window without encountering any obstacle. The limits indicated in the technical data table must not be superseded (*page 7*) and the most appropriate stroke should be selected. Calculations should be checked using the formula indicated on page 6.



**Attention.** Check that the electrical power supply corresponds to that indicated on the TECHNICAL DATA label on the machine.



Ensure that the actuator has not been damaged during transport, first visually and then by powering in both directions.



Check that the width of the inside of the window (where the actuator is to be assembled) is over 360 mm, otherwise the actuator should not be installed.



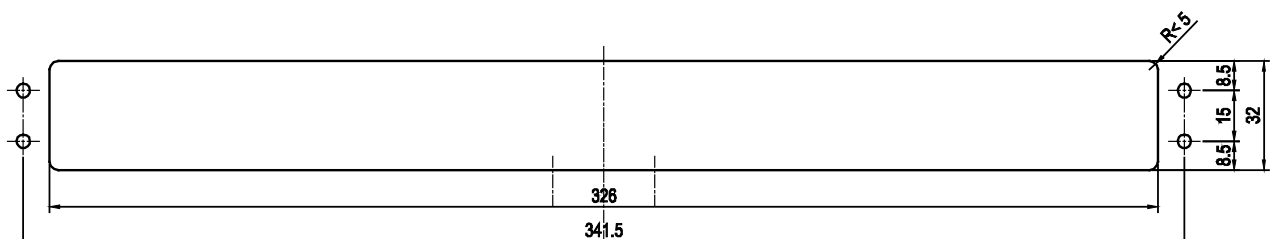
Check that once the actuator has been installed, chain completely in, the window is perfectly closed. If this is not the case the actuator will not function correctly as the window will not close correctly.

### 9.1. Preparation for mounting the actuator

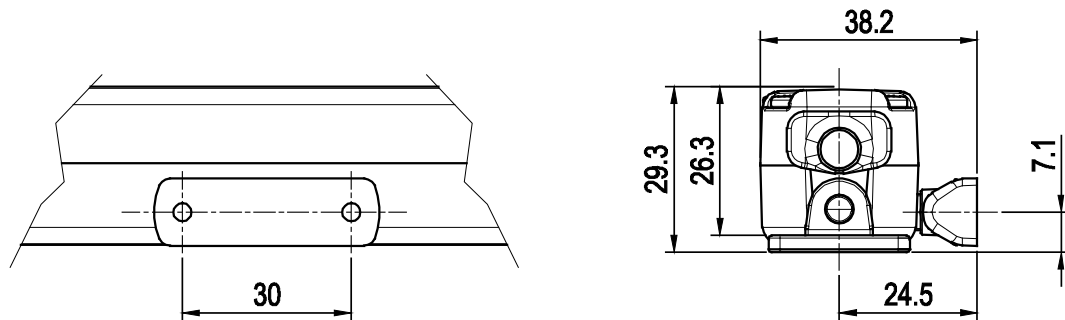
Before beginning to mount the actuator, depending on the type of application, the window frame must be prepared by carrying out the following operations:

### 9.2. Recessed mounting

For recessed mounting, the window frame must be prepared by milling and making two holes as indicated in the diagram below. The depth of the milling must be at least 30 mm.



Then make two  $\text{Ø}4.5$  holes on the sash for the attachment bracket. The measurements are specified in the diagram below.



### 9.3. Surface mounting on top-hung windows opening outwards or bottom-hung windows

The actuator can also be surface mounted on top-hung windows opening outwards or dormer windows and on bottom-hung windows, however for these specific applications special support brackets are required for the actuator which must be supplied separately.

The two half-brackets attaching the actuator to the sash, however, are the same standard brackets supplied with the actuator and included in the package.

To prepare the holes on the window frame and sash, use the drilling template included in the package of the special brackets; this template also specifies the diameter of the holes and their position in reference to the inner edge of the window frame.



**Warning.** *In order to prevent unpleasant mishaps with the machine and possible safety hazards, carefully choose the length of the clamping screws in order to avoid damaging the power supply cables during the mounting procedure.*

In order to carry out a cost-effective and precise up-to-standard work, it is best if you prepare the following complementary material: small parts, equipment and tools.

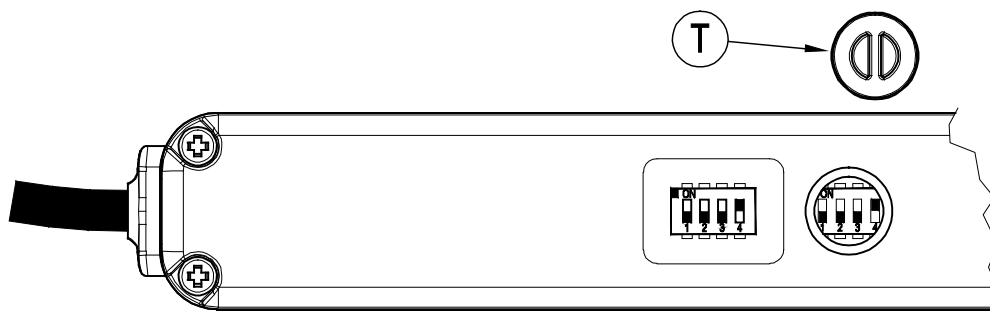
- ◆ Fastening on metal window frames: M4 threaded inserts (2 pieces for recessed mounting and 4 pieces for surface mounting), M4x12 flat head metric screws (2 pieces (4 pieces for surface mounting)).
- ◆ Fastening on wooden window frames:  $\text{Ø}4$  self-threading wood screws (2 pieces for recessed mounting and 4 pieces for surface mounting), with an appropriate length for the type of window frame.

- ◆ Fastening on PVC window frames: Ø3.9x13 self-threading metal screws (2 pieces for recessed mounting and 4 pieces for surface mounting), with an appropriate length for the type of window frame.
- ◆ Equipment and tools: tape-measure, pencil, drill/electric screwdriver, set of drill bits for metal, insert for screwing in, electrician's scissors, screwdrivers.

## 10. Programming the actuator

### 10.1. Opening stroke-end

The opening stroke-end of the actuator can be adjusted by selecting the dip-switches located inside the actuator underneath the black rubber plug (T) (see fig. below), near the label that indicates the state of the dip-switches.



The setting can be made very easily by selecting the dip-switches as specified in the table below.

STROKE (mm)	DIP-SWITCH			4
	1	2	3	
70	ON	OFF	OFF	OFF
125	OFF	ON	OFF	
170	OFF	OFF	ON	
210	OFF	OFF	OFF	



*The actuator is factory-set with the longest stroke (210 mm).*

### 10.2. Closure stroke-end

The stroke-end at closure is automatic and cannot be programmed.

The actuator stops when the charge is absorbed when the window is completely closed and the weather stripping is completely depressed, or when the charge absorbed is more than 15% of the nominal charge.

After each closure or intervention of electronic protection devices, the chain will move about 1 mm in the opposite direction to give correct compression to the seals and release the mechanical parts.

## 11. Checking for correct assembly



Check that the window is perfectly closed at corners and that there are no obstacles caused by incorrect positioning during assembly.



Check that when the window frame is closed the chain terminal is at least a few millimetres away from the actuator body. This will ensure the window is properly closed and seals are correctly compressed. In the event that this should not be the case there is no guarantee that the window is closed correctly.



Check that hinges and support brackets are aligned to each other and tightly fixed against the window frame with screws fixed correctly into position.



Check that the window reaches the desired position according to the stroke-end selected.

## 12. Emergency manoeuvres, maintenance or cleaning

In the event that the window frame should require manual opening due to power failure or problem with the mechanism or for normal maintenance or external cleaning of the window frame, in built-in actuators it's necessary to perform these operations:

1. Unscrew the two screws that fix the sash to the attachment bracket.
2. Take care during this operation since the bracket, which is in two pieces after removing the screws, may fall as it is no longer secured.
3. Manually open the window frame.



**ATTENTION: DANGER** – *the window could fall as the sash is no longer held in position by the chain.*

4. After maintenance and/or cleaning repeat points 1 and 2 in reverse order.

## 13. Troubleshooting

Possible causes of malfunction during installation or use.

<b>Problem</b>	<b>Possible cause</b>	<b>Solution</b>
Actuator does not work	<ul style="list-style-type: none"><li>▪ No electricity at feeder</li><li>▪ Cable not connected or wire disconnected.</li></ul>	<ul style="list-style-type: none"><li>▪ Check status of circuit breaker or safety switch</li><li>▪ Check electrical connections at reduction motor</li></ul>

## 14. Environmental protection



All materials used in the manufacture of this appliance are recyclable. We recommend that the device itself, and any accessories, packaging, etc. be sent to a centre for ecological recycling as established from laws in force on recycling.

The device is mainly made from the following materials: aluminium, zinc, iron, plastic of various type, cuprum. Dispose materials in conformity with local regulations about removal.

## 15. Guarantee conditions and terms of delivery

The manufacturer will guarantee good function of the appliance. The manufacturer shall undertake to replace defective parts due to poor quality materials or manufacturing defects in accordance with article 1490 of the Civil Code.

The guarantee covers products and individual parts for **2 years** from the date of purchase. The latter is valid as long as the purchaser possesses proof of purchase and completion of all agreed conditions of payment.



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.

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 at **www.simon-rwa.com**.

Passau is the established legal venue.

## 16. Company addresses

### Germany

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