

CHAIN ACTUATOR
TYPE EA-KNA-230(24)/300/500

FORCE 300 N - MAXIMUM STROKE 500 MM
VOLTAGE 110/230 V AC & 24 V DC



MANUAL FOR INSTALLATION AND USE



ENGLISH

The machine described in this manual has been manufactured in accordance with safety standards and conforms to the stipulations of current standards in force.

When correctly assembled, installed and used according to the present instructions, it will not generate any danger for persons, animals or items.

Products subject to EU directives comply with the essential requirements stipulated by the latter.

 markings mean that our products can be sold and installed throughout the European Union without any further formality.

The  marking on the product, packaging and indications for use provided with the product indicate 'presumed conformity to the directives' issued by the European Community. The manufacturer holds the technical archive with documentation providing that products have been examined and evaluated for conformity to directives.

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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.

Series EA-KNA-230/300/500 & EA-KNA-24/300/500 chain actuators have been designed to move windows.

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

The following safety indications should be observed carefully.

- If the Installation of power operated windows (even with parts of the windows) is less high than 2,5 m, Risk assessment is a necessary.
- 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.
- The actuator must be installed in accordance with the manufacturer's instructions. Failure to respect these instructions could compromise safety.
- 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.
- 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.
- 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.

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.

Danger of crushing or dragging. During function, when the actuator closes the window, a force of 300N 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.

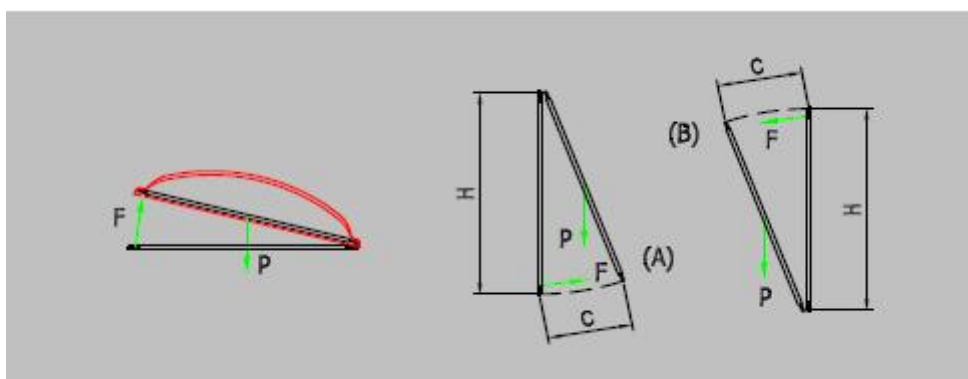
In the event of breakage or malfunction, switch the appliance off at the general switch and call for the services of a qualified technician.

2. FORMULAS AND RECOMMENDATIONS FOR INSTALLATION

2.1. 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

<u>For horizontal light domes or skylights</u>	<u>For vertical windows</u>
$F = 0.54 \times P$ (Eventual weight of snow or wind on the cupola should be calculated separately).	• 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.)

2.2. Maximum opening according to height of sash

The actuator stroke is in accordance with the height of the sash and its application. Check that the actuator stroke does not touch the profile of the sash and that the chain does not exert force on the window frame (Measurements in mm).

ATTENTION. For safety reasons the actuator should not be assembled if dimensions are inferior to those indicated in the table below. In the event that the height of the sash should be lower, call on the manufacturer to check the appliance.

Mode of installation	Selection of actuator stroke			
	200	300	400	500
Light domes, skylights or vertical top hung windows opening outwards with frontal assembly	250	350	450	600
Top hung windows opening outwards with horizontal assembly	200	300	400	600
Bottom hung windows (motor on frame)	200	300	400	500
Bottom hung windows (motor on sash)	Consult manufacturer			

3. USE OF ACTUATOR IN 'SYNCRO' VERSION

In the **SYNCRO** version the actuator has been equipped with the new system patented by NEKOS for coordinated synchronisation of chain movement. Electronic control of speed is completely automatic and does not require any external control station: connect the RED and WHITE cables on the feeder cable to each other (see diagram on page 14).

3.1. Recognition

Three elements differentiate the SYNCRO version of the actuator from other actuators in the EA-KNA-230/300/500 & EA-KNA-24/300/500 series:

- The technical data label with the "..... **SYNCRO**" label.
- The SYNCRO label to one side of the technical data label on the actuator.
- The electrical cable with 5 wires (3+2) for the 110/230VAC version and the 5 wire cable (2+1+2) for the 24VDC version.



3.2. Window assembly

The **SYNCRO** actuator is assembled when two latch points are required for particularly heavy or wide windows (1.2m to 3m) and a single actuator does not permit perfect closure of the window frame. Note that the force exerted by the actuators individually is the same as that of a similar actuator. When two actuators are assembled the force exercised on the window is doubled. Movement of the window frame is uniform, synchronised and coordinated without interruptions and/or variations in speed for the two actuators. In the event that one of the actuators should cease function due to mechanical or electrical cause, the other will also stop function, thus guaranteeing the integrity of the window.

4. TECHNICAL INFORMATION ABOUT FUNCTION

The chain actuator opens and closes the window using a double row steel chain inside a sheath. Movement is generated using electrical energy that powers a reduction motor controlled by a functional electrical device. Windows can be programmed to open and the device allows chain opening at 200, 300, 400 and 500 mm. When the window returns to start position, that is during closure, the stroke-end uses an electronic self regulating process with absorption of energy and no regulation is therefore required. The actuator is produced by the factory with the stroke-end for return set at around +1 cm (out by 1 cm). This allows the actuator to be assembled without electrical energy powering movement and means that the window remains closed after assembly. The joint between actuator and support brackets is quick, requires no fixing screws (NEKOS patent) and allows the actuator to rotate to follow the track of the chain even on shorter windows.

5. TECHNICAL DATA

Model	EA-KNA-230/300/500	EA-KNA-24/300/500
Force exerted by thrust and traction	300 N	
Strokes (can be selected at any time)	200, 300, 400, 500 mm	
Power supply voltage	110/230 V AC 50/60 Hz	24 V DC
Rated absorbed current	0,160 A	0,910 A
Power absorbed at nominal load	36 W	20 W
Idle traverse speed	7,2 mm/s	8,9 mm/s
Duration of idle stroke (500 mm)	70 s	56 s
Double electrical insulation	YES	
Type of service	S ₂ of 3 min.	
Pause time during direction change	≥ 1 s	
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	
Synchronised function	YES (mod. SYNCRO)	
Static hold force	1700 N	
Stroke-end at opening	Electronic	
Stroke-end at closing	At absorption of power	
Length of power cable	2 m, SYNCRO 2,5 m	
Dimensions	456 x 60 x 43 mm	
Weight	2,25 kg	2,23 kg

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

6. CONSTRUCTION AND STANDARDS

The EA-KNA-230/300/500 & EA-KNA-24/300/500 chain actuator has been designed and manufactured to open and close top hung windows opening outwards, bottom hung windows, dormer windows, light domes and skylights. Specific use is for ventilation and airing of areas as well as moving casements in extractor systems for smoke and heat alongside the EA-KNA-230/300/500 & EA-KNA-24/300/500 actuator. Any other use must previously be approved by the manufacturer.

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 marking.

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:

- 110/230VAC 50/60Hz or 24 V DC electrical actuator.
- 2 (2.5) metre ($\pm 5\%$) cable with moulded connector.
- Standard support brackets (A).
- Adhesive boring template.
- Instructions manual.
- Bracket for bottom hung assembly (C) (supplied separately only on request).
- Bracket for top hung outward opening assembly (D) (supplied separately only on request).

7. ID PLATE AND MARKING DATA

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

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

The manufacturer holds the technical archive with documentation providing that products have been examined and evaluated for conformity to directives.

ID plate data are indicated on a polyethylene adhesive label applied externally on the outside of the container, printed in black on a grey background. Values conform to EC requirements in force.

8. ELECTRICAL POWER SUPPLY

The Series EA-KNA-230/300/500 & EA-KNA-24/300/500 actuator is commercially available in four versions identified according to electrical specifications:

1. **EA-KNA-230/300/500**: runs on grid tension of 110/230VAC, 50/60Hz ($\pm 10\%$), with a three wire cable (**LIGHT BLUE**, common neutral; **BLACK**, phase open; **BROWN**, phase closed) with a moulded connector.
2. **EA-KNA-230/300/500 SYNCRO**: runs on grid tension of 110/230VAC, 50/60Hz ($\pm 10\%$), with a five wire cable (**LIGHT BLUE**, common neutral; **BLACK**, phase open; **BROWN**, phase closed) with a moulded connector. The additional wiring (**RED** and **WHITE**) is for electronic synchronisation (NEKOS Patent).
3. **EA-KNA-24/300/500**, for smoke and heat extraction: runs on 24VDC, with three wire cable, **BLACK "1"**, connected to the + (positive) closes; **BLACK "2"**, connected to the + (positive) opens. A third wire **BLACK "3"**, is used for signalling 'window open/window closed' (see instructions manual for the RWA EGON station, chapter entitled 'Connections').
4. **EA-KNA-230/300/500 SYNCRO**: Like the previous actuator, this version is destined for the smoke and heat extraction, and runs on 24VDC, with five wire cable, **BLACK "1"**, connected to the + (positive) closes; **BLACK "2"**, connected to the + (positive) opens. The third wire **BLACK "3"**, is used for signalling 'window open/window closed' (see instructions manual for the RWA EGON station, chapter entitled 'Connections'). The additional wiring (**RED** and **WHITE**) is for electronic synchronisation (NEKOS Patent).

Low tension actuators 24VDC (RWA) can be powered using the EGON station (with emergency battery) or feeder with an output tension of 24VDC ($-15\% \div +20\%$, or min. 20.4V, max. 28.8V).

The feeder must be approved and class II (double safety insulation).

8.1 Selection of power cable section

For 24Vdc power supply cable section must be checked and calculated according to cable length. The following table indicates maximum cable lengths for connection to motors.

Cable section	Maximum cable length
4.00 mm ²	~ 270 m
2.50 mm ²	~ 170 m
1.50 mm ²	~ 100 m
0.75 mm ²	~ 50 m
0.50 mm ²	~ 35 m

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 5.



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 500 mm, otherwise the actuator should not be installed.



Check that once the actuator has been installed the distance between the fixed part of the window frame (where the actuator is to be assembled) and the mobile part of the window frame (where the bracket is to be fixed) is greater than or equal to 0 mm (Fig. 1). If this is not the case the actuator will not function correctly as the window will not close correctly. If required, add additional thickness below the support brackets to reset the quota.



Figura 1



For bottom hung window frames injury could be caused by accidental falls of the window. 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.

9.1 Preparation of actuator for assembly

Before starting assembly of the actuator, prepare the following material for completion, equipments and tools.

- For fixing onto metal window frames: M5 threaded inserts (6 pieces), M5 x 12
- For fixing onto wooden window frames: self threading screws for wood $\varnothing$ 4,5 mm (6 pieces)
- For fixing onto PVC window frames: self threading screws for metal $\varnothing$ 4,6 mm (6 pieces)
- Equipment and tools: measuring tape, pencil, drill/screwdriver, set of drill heads for metal, insert for screwing in, electricians pliers, screwdrivers.

9.2. Assembly for top hung windows, outward opening

A. Trace centrepoint X in pencil onto the window frame (Fig.2).



Figure 2

B. Use brackets "A" art. 4010044 (*provided*) and hinge "D" art. 4010039 (*sold separately*) (Fig.3).



Figure 3

C. Apply the adhesive template onto the window frame (fixed part), taking care to ensure that the axis of the template coincides with centrepoint X traced earlier (Fig.4).

Attention: for non complanar window frames, cut the grey part of the template along the red line and apply onto the mobile part of the window frame, taking care to keep it in the same reference position for the X axis.

D. Bore the window frame at the points indicated on the adhesive template (Fig.5).

E. Apply the brackets (A) to the window frame using flat head screws as indicated above. Check both horizontal and vertical alignment of brackets.

F. Assemble the hinge for top hung windows (D) onto the mobile part of the window frame using the reference

points indicated on the template.

G. Complete assembly between chain terminal and quick hook using the $\varnothing$ 4x32 pin provided and insert into central position (Fig.6).

H. Hook the actuator onto the brackets inserting the two channels at the end of the actuator into the pins provided.

I. Rotate the actuator 90°, bring the chain terminal up to the hinge and insert the pin into the channel of the latter. Connect the quick hook onto the bracket. At initial connection the hook will present some resistance, this is normal as pieces need to adjust to their sockets.



Figure 4



Figure 5

J. Perform the electrical connections according to the diagram below or the label on the feeder cable.

K. Check that the output of the chain is perfectly aligned with the bracket. In the event that this should not be the case, loosen the fixing screws and reposition the bracket correctly.

L. Perform a complete test of opening and closing of the window frame. After closure, check that the window frame is completely closed and check pressure against the seals.

M. The stroke-end of the actuator during return is automatic. The appliance exerts traction of over 300N to guarantee perfect pressure against the seals.



Figure 6



Figure 7

9.3. Assembly for bottom hung windows

A. Before starting works, at least two flexible mechanical link arms or other form of safety stops **MUST** be installed to guarantee hold and prevent accidental falling of the window in order to provide safe working conditions.

B. Trace centrepoint X in pencil onto the window frame (Fig.2).

C. Use brackets "A" art. 4010044 (*provided*) and hinge "C" art. 4010038 (*sold separately*) (Fig.8).

D. Apply the adhesive template onto the window frame (fixed part), taking care to ensure that the axis of the template coincides with centrepoint X traced earlier (Fig.9).

Attention: for non complanar window frames, cut the grey part of the template along the green line and apply onto the mobile part of the window frame, taking care to keep it in the same reference position for the X axis.

E. Bore the casement at the points indicated on the adhesive template (Fig.5).

F. Apply the brackets (A) to the window frame using flat head screws as indicated above. Check both horizontal and vertical alignment of brackets.

G. Assemble the bracket for bottom hung windows onto the mobile part of the window frame using the reference points indicated on the template.

H. Complete assembly between chain terminal and quick hook using the Ø4x32 pin provided and insert into central position (Fig.6).



Figure 8



Figure 9



Figure 10

I. Hook the actuator onto the brackets inserting the two channels at the end of the actuator into the pins provided.

J. Rotate the actuator 90°, bring the chain terminal up to the hinge and insert the pin into the channel of the latter. Connect the quick hook onto the rod (Fig. 10).

K. Perform the electrical connections according to the diagram below or the label on the feeder cable.

L. Check that the output of the chain is perfectly aligned with the bracket. In the event that this should not be the case, loosen the fixing screws and reposition the bracket correctly.

M. Perform a complete test of opening and closing of the window frame. After closure, check that the window frame is completely closed and check pressure against the seals.

N. The stroke-end of the actuator during return is automatic. The appliance exerts traction of over 300N to guarantee perfect pressure against the seals.

10. ELECTRICAL CONNECTIONS

Appliances are equipped with cable and moulded connector manufactured in accordance with safety standards and protection against radio disturbances.

EACH ACTUATOR MODEL MUST USE ITS OWN SPECIFIC CABLE.

Before performing the electrical connection consult the table below and check correspondence between the feeder cable and the tension data on the actuator label.

Tension	Cable length	Number of wires	Wire colours	Colour of wires used for notification
110/230 V AC, 50/60 Hz	2 m	3	LIGHT BLUE BLACK BROWN	-
RWA 24 V DC	2 m	3	BLACK 1 BLACK 2	BLACK 3
110/230 V AC, 50/60 Hz, Syncro	2,5 m	5	LIGHT BLUE BLACK BROWN	WHITE RED
RWA 24 V DC Syncro	2,5 m	5	BLACK 1 BLACK 2	WHITE RED BLACK 3

If feeder cables require extending to the control button for low voltage actuators (24VDC), cable sections should be selected accordingly.
Conductor sections are indicated in the table on page 9 (*Selection of cable section*).
For cabling, follow the diagrams below.

The cable for SYNCRO actuators is 2.5m long. If the distance between the actuator and the control button is greater than 2.5m, **extend conductors only for electrical power**.



ATTENTION. WHITE and RED wires cannot be extended and must be connected together at a length equal or less than 2.5m; connection distances over 5m do not guarantee good communication of the synchronisation signal. Electrical connection of the two wires should be performed using a simple appropriately sized bell clamp (*supplied with the appliance*). Secure connections with good electrical contact are vital as the passage tension is very low (5V).

IMPORTANT. CONNECT THE TWO WIRES (WHITE AND RED) BEFORE ANY OTHER OPERATION ON THE ACTUATORS, IF POSSIBLE WITH CHAINS COMPLETELY RETURNED TO AVOID ANY COMMUNICATION PROBLEMS BETWEEN THE TWO ACTUATORS.

11. PROGRAMMING THE ACTUATOR

11.1. Stroke-end at opening

Set dip-switches nos.1 and 2 (see figure beside and table below) to select one of the 4 (*four*) stroke-end positions for the chain exit. Programming is simple, immediate and can be performed any time.



STROKE-END	DIP-SWITCH	
	No. 1	No. 2
200 mm	OFF	OFF
300 mm	ON	OFF
400 mm	OFF	ON
500 mm	ON	ON

After programming the stroke-ends, perform test manoeuvres. In the event of error, programming can be repeated to obtain the desired stroke.

11.2. Stroke-end at closure

The stroke-end at closure is automatic and cannot be programmed. The actuator stops when the power encountered by the actuator when the window reaches complete closure is absorbed and the seals are pressed right in, or when the absorbed power is over 10% of the nominal power. In this case, at maximum load the actuator exerts traction of over 330N.

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.

When the window frame is closed, check that the chain terminal protrudes a couple of millimetres from the actuator body. This will ensure that the window is correctly

closed and that correct pressure is exerted on the seal. If this is not the case there is no guarantee that the window is completely closed. Check that hinges and support brackets are rigidly attached to the window frame and all screws correctly fixed into position. For aluminium window frames, do not use self threading or self perforating screws as these will tear the profile after a few manoeuvre; use metric screws with threaded inserts (see indication on page 11)

11.3. Programming synchronised function

To function in synchronised and coordinated mode EA-KNA-xxx/300/500 SYNCRO actuators must be correctly programmed. SYNCRO actuators can also be used individually if correctly programmed. Programming consists of the definition of function as follows:

- SYNCRO: Primary (Master) or Secondary (Slave) actuator.
- STANDARD: actuator functions individually.

For programming, set dip-switches nos. **3** and **4**

<i>Actuator function</i>	<i>Dip-switch</i>	
	<i>no. 3</i>	<i>no. 4</i>
PRIMARY / MASTER	ON	OFF
SECONDARY / SLAVE	OFF	OFF
INDIVIDUAL	ON	ON



11.4. Repetition of programming

If actuator function is not synchronised, reset and reprogramme actuators as indicated below:

- Reset programming for both actuators to “SINGLE” function by setting dipswitches 3 and 4 to **ON**;
- Disconnect the WHITE and RED wires;
- Perform an exit movement along the whole stroke;
- Bring the chain right back in;
- Reconnect the WHITE and RED wires and reprogramme the actuators as PRIMARY and SECONDARY (Master/Slave) according to the examples below.

Example of programming for dip-switches for two synchronised actuators:

- Actuator no. 1: dip-switch no. 3 at **ON**, dip-switch no. 4 at **OFF**.
- Actuator no. 2: dip-switch no. 3 at **OFF**, dip-switch no. 4 at **OFF**.

12. 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.

13. 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, the NEKOS patent allows rapid unhooking of the chain. To perform this operation, proceed as follows:

1. Unhook the flap of the quick hook locking the chain terminal to the bracket.
2. Hold the window in one hand and remove the pin of the chain terminal from the two u channels on the bracket with the other. *(this operation should be performed with the window open at least 10 cm to facilitate unhooking of the chain).*
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.

14. TROUBLESHOOTING

Possible causes of malfunction during installation or use.

Problem	Possible cause	Solution
Actuator does not work	▪ No electricity at feeder ▪ Cable not connected or wire disconnected.	▪ Check status of circuit breaker or safety switch ▪ Check electrical connections at reduction motor
Despite correct selection, actuator does not take the stroke-end set	▪ Programming not performed correctly	▪ Reprogramme dip-switches

15. ENVIRONMENTAL PROTECTION

All materials used for the manufacture of the appliance can be recycled. We recommend that the appliance itself, accessories, packaging etc be sent to a centre for ecological recycling.

16. CERTIFICATE OF GUARANTEE

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.

Guarantee of good function of appliances agreed by the manufacturer implies that the latter undertakes to repair or replace free of charge and in the shortest period possible any parts that break while under warranty.

The purchaser is not entitled to any reimbursement for eventual direct or indirect damage or other expenses incurred. Attempt to repair by personnel unauthorised by the manufacture shall render the warranty null and invalid.

The warranty does not cover fragile parts or parts subject to natural wear and tear or corrosion, overload, however temporary etc. The manufacturer will accept no responsibility for eventual damage incurred by erroneous assembly, manoeuvre or insertion, excessive stress or inexperienced use.

Repairs performed under guarantee are always "*ex factory of the manufacturer*". Respective transport expenses (out/back) are the responsibility of the purchaser.

17. EC-Manufacturer's declaration



We herewith declare the conformity of the product with the applicable directives. The declaration of conformity can be viewed at the company and is mailed to you upon request. This declaration is rendered invalid with any changes not agreed to by us.

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