



KATO – KATO SYNCRO³

EN

INSTRUCTION MANUAL **CHAIN ACTUATOR**

Force 300N – Maximum stroke 400 mm

Electrical feeding 110-230V~ 50/60Hz and 24V---



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USER INSTRUCTIONS

CAUTION. Carefully observe all the following installation instructions to ensure personal safety.

The device is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lacking experience and knowledge. Do not allow children to play with the fixed controls and keep any remote-control units out of their reach.

Have installation checks performed periodically by qualified personnel from a service centre authorised by the manufacturer. Do not use if repair or adjustment is required.

CAUTION: if the power cable is damaged, it must be replaced by qualified personnel from a service centre authorised by the manufacturer.

CAUTION. Disconnect the power supply during cleaning or maintenance operations. Do not use solvents or jets of water to wash the appliance; the appliance should not be submerged in water.

In the event of fault or malfunction, switch off the device at the main switch. All repairs and adjustments (e.g. setting the stroke) must only be performed by qualified personnel from a service centre 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.

The A-weighted sound pressure level is less than 70dB(A).

Carefully preserve these instructions after installation.

INSTALLER INSTRUCTIONS

nekos products have 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, they will not generate any danger for persons, animals or items.

Symbols used in the manual



DANGER

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

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1. SECURITY RULES



CAREFULLY OBSERVE ALL THE FOLLOWING INSTALLATION INSTRUCTIONS TO ENSURE PERSONAL SAFETY. IMPROPER INSTALLATION CAN SERIOUSLY ENDANGER SAFETY.



MANDATORY RISK ANALYSIS AND PROTECTION MEASURES.

The Nekos electrical actuators comply with the Machinery Directive (2006/42/EC), Standard IEC 60335-2-103 (Particular requirements for drives for gates, doors and windows) and other directives and regulations indicated in the attached Declarations of Incorporation and CE Conformity (at the end of the manual). According to the Machinery Directive, actuators are “partly completed machinery” intended for incorporation into doors and windows. The manufacturer/supplier of the window is required, with exclusive responsibility, to ensure the compliance of the entire system with the applicable standards and to issue CE certification. We strongly discourage any use of the actuators other than that specified and therefore, in any case, the supplier of the complete system retains full liability.

For systems installed at a height of less than 2.5 m above floor level or other levels accessible to users, the manufacturer/supplier of the window must conduct **risk analysis** regarding potential harm (violent blows, crushing, wounds) caused to people by normal use or possible malfunction or accidental breakage of the automated windows, and to implement suitable protective measures in view of these. Such measures include those recommended by the specified standard:

- controlling the actuators via a “deadman’s button” placed near the system and within the operator’s field of view, to ensure that people are out of the way during operation. The button must be placed at a height of 1.5 m and operated by key if accessible to the public; or:
- use of contact safety systems (also included in the actuators) that ensure a maximum closing force of 400/150/25 N, measured in accordance with paragraph BB.20.107.2 of IEC 60335-2-103; or:
- use of non-contact safety systems (lasers, light grids); or:
- use of fixed safety barriers that prevent access to moving parts.

Automated windows are deemed adequately protected if they:

- are installed at a height of >2.5 m; or:
- have a leading-edge opening of <200 mm and a closing speed of <15 mm/s; or:
- are part of a smoke and heat evacuation system for emergency use only.

In any case, moving parts of windows that could fall below 2.5 m following breakage of a system component need to be fixed or secured in order to prevent them from suddenly falling or collapsing: e.g. the use of safety arms on bottom-hung windows.



The device is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lacking experience and knowledge. Do not allow children to play with the fixed controls and keep any remote-control units out of their reach.

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

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

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.

2. 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 an electrical device. Windows can be programmed to open and the device allows chain opening at 110, 200, 300 and 400 mm for KATO, 100, 200 and 400 mm for KATO Syncro³.

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 chain 1 cm out. 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.

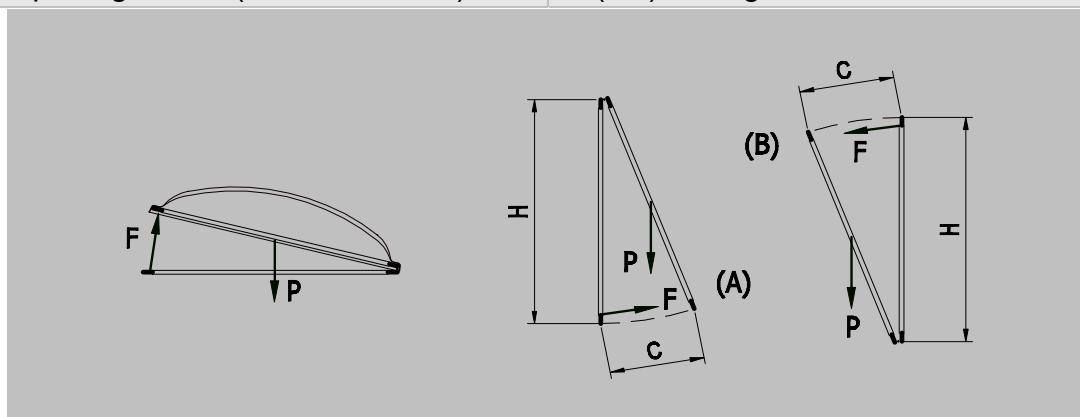
3. FORMULAS AND RECOMMENDATIONS FOR INSTALLATION

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 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.

<u>Mode of installation of KATO</u>	<i>Selection of actuator stroke</i>			
	110	200	300	400
Light domes, skylights or vertical top hung windows opening outwards with frontal assembly	150	250	350	450
Top hung windows opening outwards with horizontal assembly	150	250	350	450
Bottom hung windows (<i>motor on frame</i>)	250	450	600	700
Bottom hung windows (<i>motor on sash</i>)	Consult manufacturer			

<u>Mode of installation of KATO Syncro³</u>	<i>Selection of actuator stroke</i>		
	100	200	400
Light domes, skylights or vertical top hung windows opening outwards with frontal assembly	150	250	450
Top hung windows opening outwards with horizontal assembly	150	250	450
Bottom hung windows (<i>motor on frame</i>)	250	450	700
Bottom hung windows (<i>motor on sash</i>)	Consult manufacturer		

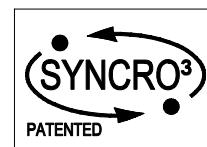
4. USE OF ACTUATOR IN 'SYNCRO³' VERSION

In the **SYNCRO³** 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*).

4.1. Recognition

To recognise on sight chain actuator KATO Syncro³ pay attention to 3 important differences:

- Label with Syncro mark
- Electrical feeding cable with 5 wires
- Dip-switch on actuator hip with four switches



4.2. When it has to be mounted

KATO Syncro³ chain actuator is mounted when are necessary two or more attach points because window is particularly heavy or large and a single actuator doesn't allow the perfect frame closure. Please remind that force executed from a single actuator is the same as from an analogue KATO actuator; so, for example, mounting two actuators the force applied on frame is double. Frame movement occurs uniformly, synchronized and coordinated without interruptions and/or speed variations of the actuators. In case of one of the actuators doesn't run for any mechanical or electrical impediment, the others stop too, guarantying in this way frame integrity.

IMPORTANT: when calculating the dimensions of a system with multiple Syncro³ actuators, it is advisable to consider the force of each actuator as 90% of that stated on the plate.

5. CONSTRUCTION AND STANDARDS



INTENDED USE. The **KATO** and **KATO SYNCRO³** chain actuators have 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; any other use is strongly discouraged, with the

supplier of the entire system in any case retaining sole liability.
The actuator is manufactured in accordance with the Directives and following Regulations listed in the attached Declaration of Incorporation and Conformity **CE**.
Electrical connections must conform to regulations in force for the design and set up of electrical equipment.
To ensure efficient separation from the grid, an approved type of bipolar “dead-man” 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.

The KATO actuator is packed in one single carton. Each package contains:

- Actuator with 2 metres ($\pm 5\%$) lead, 2,5 metres for KATO Syncro³.
- Standard support brackets with distancer (A).
- Bracket for vertical assembly of the actuator (B).
- Bracket for transom window (C).
- Bracket for outward opening fixture (D).
- Template for boring.
- Small parts packaging.
- Instruction manual.

IMPORTANT. The Syncro³ version of the actuator is packed in a cardboard box with two units and all accessories needed and is shipped already tested. However, the RESET procedure must still be performed.

When installing a system that requires the use of several Syncro³ actuators or a BK-LOCK electro-lock, a new RESET procedure must be performed.

6. TECHNICAL DATA

<i>Model</i>	<i>KATO 230V</i>	<i>KATO 24V</i>	<i>SYNCRO³ 230V</i>	<i>SYNCRO³ 24V</i>
Force exerted by thrust and traction (F_N)	300N		300N	
Strokes (S_V)	110/ 200/ 300/ 400 mm		100/ 200/ 400 mm	
Power supply voltage (U_N)	230V~	24V---	110-230V~	24V---
Rated absorbed current (I_N)	0,25 A	0,9 A	0,34A-0,21A	0,95 A
Power absorbed at nominal load (P_N)	~27 W	~22 W	~26-27 W	~23 W
No load speed	14,6 mm/s	14,6 mm/s	8,9 mm/s	8,9 mm/s
Duration of no load stroke (400 mm)	27 s	27 s	44 s	44 s
Electrical insulation	Class II	Class III (Selv)	Class II	Class III (Selv)
Type of service (D_R)	2 cycles	5 cycles	2 cycles	5 cycles
Operating temperature	- 5 + 65 °C		- 5 + 65 °C	
Protection index for electrical devices	IP30		IP30	
Adjustment of connection to window frame	Automatic definition of position		Automatic definition of position	
Parallel powering of two or more motors	Yes (max 20)		Yes (max 10)	
Synchronised function	No		Yes (max 8)	
Holding nominal force (<i>it can vary according to the chosen brackets</i>)	1600 N		1600 N	
Stroke-end at opening	Electronic with regulation by means of dip-switches		Electronic with regulation by means of dip-switches	
Stroke-end at closing	At absorption of power		At absorption of power	
Signalling 'window open/window closed'	No	No	No	No
Length of power cable	2 m	2 m	2,5 m	2,5 m
Dimensions	386,5x59x37 mm		386,5x59x37 mm	
Weight (Kg)	0,980	0,970	1,150	1,150

Any information reported in this table is not binding and may be susceptible to variations without notice.

7. ID PLATE AND MARKING DATA

The KATO and KATO SYNCRO³ actuators have CE marking and comply with the Standards listed in the Declaration of Conformity. They also come with a Declaration of Incorporation, due to their classification by the Machinery Directive as “partly completed machines”. Both declarations are included in the final pages of this manual.

The plate data is displayed on an adhesive label placed on the outside of the casing, which must remain intact and visible.

The main information it displays includes: manufacturer's address, product name - model number, technical characteristics, production date and serial number.

In the event of a complaint, please indicate the serial number (SN) displayed on the label.

An explanation of the symbols used on the label to abbreviate the technical characteristics is given in the table in the chapter on “TECHNICAL DATA”.

8. ELECTRICAL POWER SUPPLY

The KATO and KATO SYNCRO³ actuators are commercially available in four versions:

1. **KATO 230V**: runs on grid tension of 230V~ 50/60Hz, with a three wire cable (**LIGHT BLUE**, common neutral; **BLACK**, phase open; **BROWN**, phase closed).
2. **KATO SYNCRO³ 230V**: runs on grid tension of 110-230V~ 50/60Hz, with a five wire cable (**LIGHT BLUE**, common neutral; **BLACK**, phase open; **BROWN**, phase closed). The additional wiring (**RED** and **WHITE**) is for electronic synchronisation (NEKOS Patent).
3. **KATO 24V**: runs on 24V $\overline{\text{---}}$, with three wire cable, (**RED “1”**, connected to the + (positive) closes; **BLACK “2”**, connected to the + (positive) opens. A third wire **GREEN “3”**, is used for the possible connection to the BK-LOCK electromechanical lock).
4. **KATO SYNCRO³ 24V**: runs on 24V $\overline{\text{---}}$, 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 the possible connection to the BK-LOCK electromechanical lock). The additional wiring (**RED** and **WHITE**) is for electronic synchronisation (NEKOS Patent).

Low tension actuators 24V $\overline{\text{---}}$ must be powered using a security feeder with an output tension of 24V $\overline{\text{---}}$ (min. 20.4V, max. 28.8V).

8.1. Selection of power cable section

Tension falls due to current passage in conductors is a basic aspect for safety and good appliance function. It is therefore extremely important that the conductor section in function of cable length is calculated correctly.

The following table indicates cable lengths for an actuator connected at nominal charge.

CABLE SECTION	Actuator fed at		
	24V $\overline{\text{---}}$	110V~	230V~
0.50 mmq	~20 m	~300 m	~1400 m
0.75 mmq	~30 m	~450 m	~2100 m
1.00 mmq	~40 m	~600 m	~2800 m
1.50 mmq	~60 m	~900 m	~4000 m
2.50 mmq	~100 m	~1500 m	~6800 m
4.00 mmq	~160 m	~2500 m	~11000 m
6.00 mmq	~240m	~3700 m	~15000 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:



Before installing the actuator, check that the moving parts of the window on which it is to be installed are in perfect working condition and that they open and close properly and are well balanced (where applicable).

Check that the electrical supply used corresponds to the indications on the "TECHNICAL DATA" label attached to the machine and that the given temperature range is compatible with the place of installation.

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*.

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 405 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. 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.

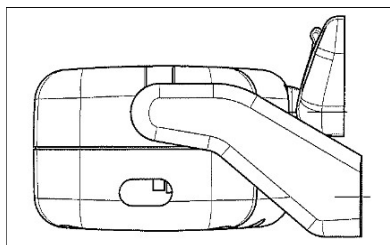
For bottom hung window frames injury could be caused by accidental falls of the window. An appropriately sized flexible link arm or fall prevention safety system designed to resist a force equal to at least three times the total weight of the window **MUST** be installed.

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*), M5x12 flat headed metric screws (*6 pieces*).
- ◆ For fixing onto wooden window frames: self threading screws for wood Ø4.5 (*6 pieces*).
- ◆ For fixing onto PVC window frames: self threading screws for metal Ø4.8 (*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 with outward opening window



Application on outward opening

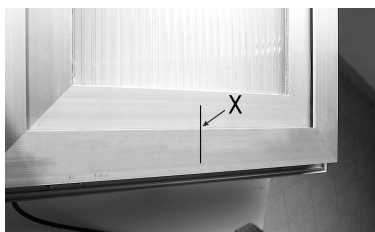


Figure 2



Figure 3



Figure 4

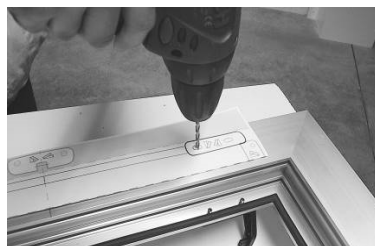


Figure 5

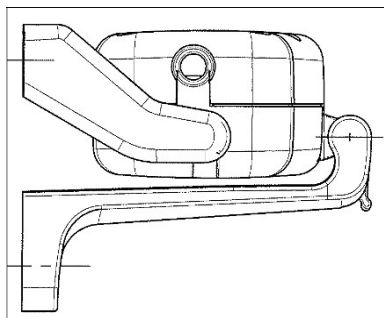


Figure 6

Above the drawing of specific application using accessories provided. For different mountings, please contact manufacturer.

- A. Pencil in an "X" over the centre line of the window frame (Fig. 2) or fairly divide it in case of use of more KATO Syncro³.
- B. Select the correct form of brackets (Fig. 3).
- C. Attach the template to the window frame (fixed part) and line axis up with the centre line "X" traced earlier (Fig. 4). **Warning:** for window frames not on the same plane, cut the part of the template coloured in grey and fix this to the moveable part of the window frame, taking care to keep it in the same position.
- D. Bore holes in the window frame at the points indicated on the template (Fig. 5).
- E. Assemble the two brackets with the distancer (to help position correctly. Once it has served its purpose it can be removed). Mount the supports onto the frame with the appropriate screws provided. Check that everything is aligned both horizontally and vertically.
- F. Mount the bracket for outward opening windows onto the moveable part of the frame in accordance with the markings indicated on the template.
- G. Complete assembly of the chain terminal with the rapid release hook inserted onto the pin Ø4x32 (provided) in median position (Fig. 6).
- H. Mount the actuator onto the brackets by inserting the two openings at each side onto the corresponding pins on the brackets.
- I. Rotate the actuator 90°, bring the chain terminal up to the bracket and insert the pin into the opening on the bracket. Insert the rapid release hook into the bracket. For the first few times, this may fairly stiff, but in time the pieces involved will adapt to their positions.
- J. Check that the exit on the chain is perfectly aligned with the bracket. If the chain is not aligned with the bracket, loosen the fixing screws and reposition the bracket correctly.
- K. Check all electrical connections with the diagram on the label attached to the lead.
- L. Carry out a complete check of opening and closure of the window. Once the closure phase has been completed, check that the window frame is completely closed by checking the pressure on the weather strips.
- M. On re-entry the actuator limit switch functions automatically. The device exerts a traction force to guarantee perfect sealing up of the weather strips.

9.3. Assembly on transom window



Application on transom window



Figure 7



Figure 8

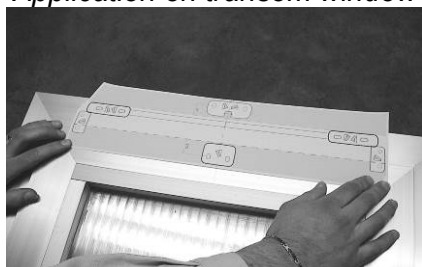


Figure 9

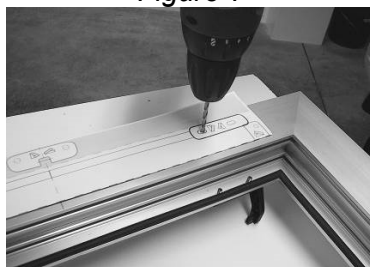


Figure 10

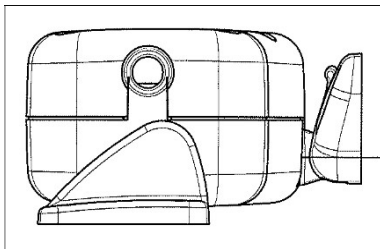


Figure 11

Above the drawing of specific application using accessories provided. For different mountings, please contact manufacturer.

- A. Before starting, check that there are at least two mechanical compass safety stops or other form of stops connected to the frame, and ensure that the stops can prevent any accidental fall of the window. Your safety is at hand.
- B. Pencil in an "X" over the centre line of the window frame (Fig. 7) or fairly divide it in case of use of more KATO Syncro³.
- C. Select the correct form of brackets (Fig. 8).
- D. Attach the template to the window frame (fixed part) and line axis up with the centre line "X" traced earlier (Fig. 9). **Warning:** for window frames not on the same plane, cut the part of the template coloured in grey and fix this to the moveable part of the window frame, taking care to keep it in the same position.
- E. Bore holes in the window frame at the points indicated on the template (Fig. 10).
- F. Assemble the two brackets with the distancer (to help position correctly. Once it has served its purpose it can be removed). Mount the supports onto the frame with the appropriate screws provided. Check that everything is aligned both horizontally and vertically.
- G. Mount the bracket for outward opening windows onto the moveable part of the frame in accordance with the markings indicated on the template.
- H. Complete assembly of the chain terminal with the rapid release hook inserted onto the provided pin Ø4x32 in median position (Fig. 11).
- I. Mount the actuator onto the brackets by inserting the two openings at each side onto the corresponding pins on the brackets.
- J. Rotate the actuator 90°, bring the chain terminal up to the bracket and insert the pin into the opening on the bracket. Insert the rapid release hook into the bracket.
- K. Check that the exit on the chain is perfectly aligned with the bracket. If the chain is not aligned with the bracket, loosen the fixing screws and reposition the bracket correctly.
- L. Check all electrical connections with the diagram on the label attached to the lead.
- M. Carry out a complete check of opening and closure of the window. Once the closure phase has been completed, check that the window frame is completely closed by checking the pressure on the weather strips.
- N. On re-entry the actuator limit switch functions automatically. The device exerts a traction force to guarantee perfect sealing up of the weather strips.

9.4. Vertical assembly of the actuator on outward opening window



Vertical application on outward opening

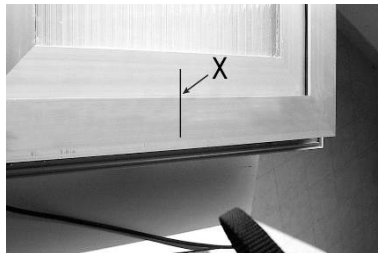


Figure 12



Figure 13



Figure 14



Figure 15

Above the drawing of specific application using accessories provided. For different mountings, please contact manufacturer.

- A. Pencil in an "X" over the centre line of the window frame (Fig. 12) or fairly divide it in case of use of more KATO Syncro³.
- B. Select the correct form of brackets (Fig. 13).
- C. Fold the template along the green dotted line and keep in position at 90°. Attach one part to the window frame (fixed part), taking care to line up the axis with the "X" previously pencilled in on the central line and line the folded part up against the moveable part of the frame. Warning: as various different applications are possible, place the actuator in a central position and adjust the positions of the brackets, taking care to keep the actuator aligned with the window section.
- D. Bore holes into the window frame at the points indicated (Fig. 14).
- E. Mount the bracket for outward opening windows onto the moveable part of the frame in accordance with the markings indicated on the template.
- F. Complete assembly of the chain terminal with the rapid release hook inserted onto the provided pin Ø4x32 in median position (Fig. 15).
- G. Mount the two brackets on to the sides of the actuator.
- H. Position the actuator onto the window frame and line up with the holes bored earlier. Fix the actuator in position with the screws provided.
- I. Bring the chain terminal up to the bracket and insert the pin into the hole on the bracket. Attach the rapid release hook to the bracket.
- J. Check that the exit of the chain is perfectly aligned with the bracket. If the chain is not aligned, loosen the fixing screws and reposition the bracket correctly.
- K. Check all electrical connections with the diagram on the label attached to the lead.
- L. Carry out a complete check of opening and closure of the window. Once the closure phase has been completed, check that the window frame is completely closed by checking the pressure on the weather strips.
- M. On re-entry the actuator limit switch functions automatically. The device exerts a traction force to guarantee perfect sealing up of the weather strips.

10. ELECTRICAL CONNECTIONS

10.1. Connections of KATO (+ optional BK-Lock electro lock)

The actuator comes with a 2 m long circa ($\pm 5\%$) lead which has been calculated in accordance with safety rules. In the event that the distance between the actuator and the control button should exceed this length, the cable should be extended.

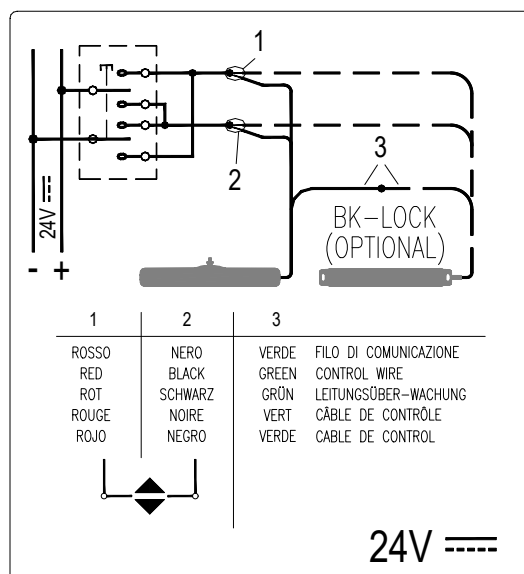
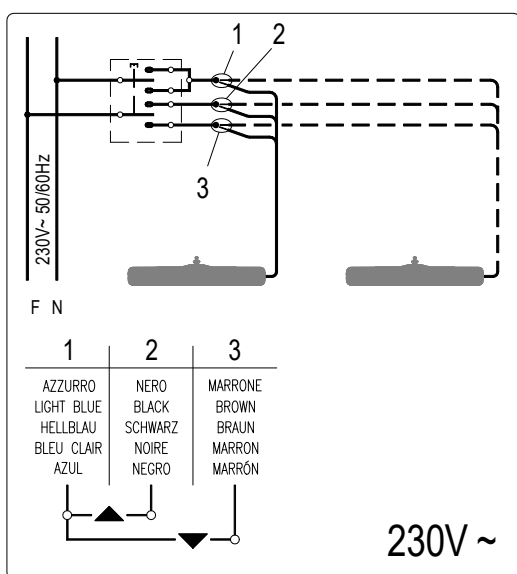
See table on *page 8* for conductor section indications.



IMPORTANT FOR PRODUCT SAFETY:

on actuators with 24V $\overline{=}$ supply voltage, KATO version, the **GREEN** wire "3", if not used with BK-LOCK electro lock, must be insulated.

For harness, please follow the following diagrams.



After connecting the electricity supply to the control button (bipolar with arrows if possible), check that the up key function opens the window frame and the and down key function closes it. In the event that keys should function to the contrary, invert cable positions.

10.2. Connections of KATO Syncro³

Cable supplied together with actuator is 2,5 m ($\pm 5\%$) long and it is calculated in accordance with safety rules. See table on *page 8* for conductor section indications.

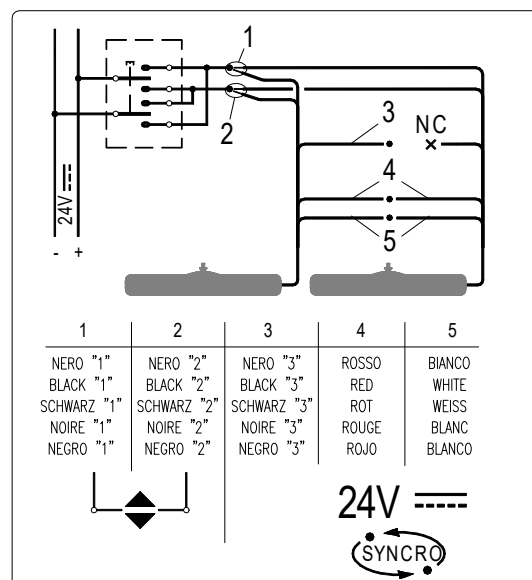
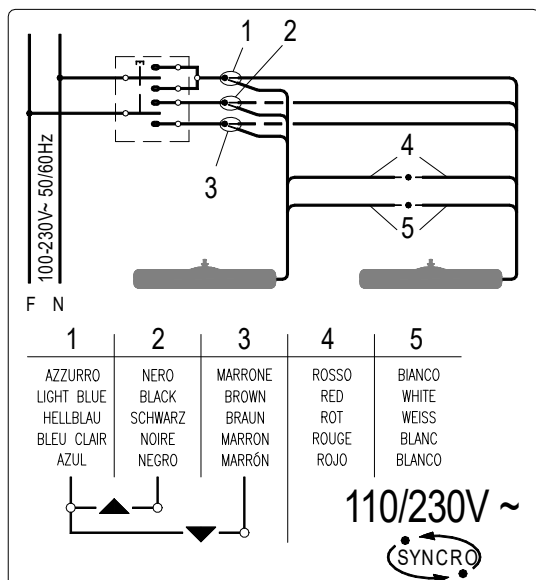
Electrical connection of cables white and red has to be done with a loose connector of proper dimensions (clamp is on equipment). Fundamental importance has a steady connection, with a good electrical contact because passing tension is very low.



IMPORTANT FOR PRODUCT SAFETY:

on actuators with 24V $\overline{=}$ supply voltage, KATO Syncro³ version, wire **BLACK** "3", if not used, must be insulated.

For harness, please follow these diagrams:



11.PROGRAMMING THE LIMIT SWITCHES

11.1. Programming KATO actuator

Electromechanical lock setting (only KATO 24V)

2 (two) positions can be selected, with or without electromechanical lock.

Mode	DIP-SWITCH No. 3
With electromechanical lock	ON
Without electromechanical lock	OFF



Limit switches at opening

4 (four) positions can be selected for the limit switch of the outgoing chain. To program, adjust the two dip-switches at the side of the LED. Programming is simple, immediate and can be carried out at any time by adjusting the two dip-switches as indicated in the following table.

Limit switches	Dip-Switch	
	Nr. 1	Nr. 2
110 mm	OFF	OFF
200 mm	ON	OFF
300 mm	OFF	ON
400 mm	ON	ON

After the limit switches have been programmed, run a few check manoeuvres. In the event of error, programming can be repeated to give the desired track run.

Limit switches at closure

The limit switch at closure is automatic, electronically operated 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. After each closure or intervention of the electrical protection mechanism, the chain moves in the opposite direction for around 1 mm. This is to loosen the tension of the mechanical parts and gives correct pressure to the weather stripping.

When the window frame is closed, check that the chain terminal is at least a couple of millimetres away from the actuator body.

This ensures proper closure for the window and ensures all weather stripping is sealed. If the chain terminal is not positioned correctly there is no guarantee that the window will close completely. Check that attachments and support brackets are firmly fixed to the window frame and that all screws have been correctly tightened.

11.2. Luminous indications on led (only for KATO 230V)

Before activating the actuator, familiarise yourself with messages indicated by the red led opposite the lead. This will allow you to check that the machine is functioning properly or allow you to recognize possible irregularities. The LED is only visible when the actuator has been turned on.

Status of LED	Meaning
Constantly lit	Motor in use.
Off and flashing	Motor has regularly reached a limit stop but is still connected to electricity supply.
Normal regular blinking	Motor in electronic protection due to excessive charge

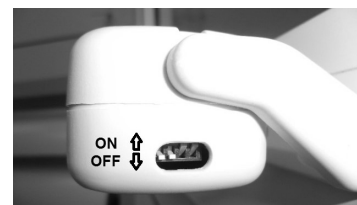
11.3. Programming the KATO Syncro³

The actuators leave the factory programmed and synchronized in pairs, thus the user only needs to select the desired stroke. It is recommended that you check to ensure that all the chains are in the same position and the actuators are connected properly as per paragraph 10.2. In the event the settings are lost, a new synchronization must be performed according to the procedures described below.

The tables below explain the meaning of the dip-switches for the Syncro or Solo operating mode (a Syncro machine that works individually) and paired with other devices.

Mode	DIP-SWITCH No. 3
SOLO	ON
SYNCRO	OFF

Mode	DIP-SWITCH No. 4
With electromechanical lock	ON
Without electromechanical lock	OFF



Opening stroke-end

Three (3) stroke-end positions can be set for the chain in excursion. The setting is done by adjusting the dip-switches No. 1 and No. 2 appropriately.

The setting is simple, immediate and executable at any time, and it is achieved by operating on the levers of the dip-switches as shown in the table below.

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

After setting the stroke-end, it is recommended that you make at least one test manoeuvre. In case of error, the setting can be repeated in order to obtain the desired stroke.

Closing stroke-end

(See specific chapter for KATO at point 11.1).

11.4. Setting for SOLO operation of a Syncro³

- Ensure that all the connections of the wires have been made correctly (for the connections of the electromechanical lock, see the respective instruction manual).
- Isolate the actuators from the power source.
- Remove the chains from the attachment of the window.
- Position the dip-switches of the machine as shown in the table below.

<i>Dip-switch</i>	<i>No. 1</i>	<i>No. 2</i>	<i>No. 3</i>	<i>No. 4</i>
With electromechanical lock	OFF	OFF	ON	ON
Without electromechanical lock	OFF	OFF	ON	OFF

- Power the machine in any direction: the machine automatically moves the chain in the closing and then opening direction, stopping automatically in the end position (about 8 cm).
- Cut off power to the machine.
- Position dip-switches No.1 and No.2 according to the desired stroke (see the opening stroke-end table).
- Connect the machine to the power supply again and carry out some opening and closing manoeuvres.

11.5. Setting for synchronized operation (chain alignment and address acquisition)

IMPORTANT. This procedure should be carried out for all the actuators that you want to synchronize with one another (max 8).

NOTE. In the case of just 2 actuators, they are already factory-set; if there are more than 2 or in the event of replacements, follow the instructions below.

- Ensure that all the connections of the wires, including the synchronization wires, have been made correctly (for the connections of the electromechanical lock, see the respective instruction manual).
- Isolate the actuators from the power source.
- Remove the chains from the attachment of the window.
- Position the dip-switches of the machines as shown in the table below.

<i>Dip-switch</i>	<i>No. 1</i>	<i>No. 2</i>	<i>No. 3</i>	<i>No. 4</i>
With electromechanical lock	OFF	OFF	ON	ON
Without electromechanical lock	OFF	OFF	ON	OFF

- Power the machines in any direction: the machines automatically move the chain in the closing and then opening direction, stopping automatically in the end position (about 8 cm).
- Ensure that all the machines have the chains aligned at the same position (about 8 cm). If the chains are not at the same position, repeat the procedure from the beginning.
- Cut off power to the machines.

- Position the dip-switches according to the table below for acquisition of the addresses.

Dip-switch	No. 1	No. 2	No. 3	No. 4
With electromechanical lock	OFF	OFF	OFF	ON
Without electromechanical lock	OFF	OFF	OFF	OFF

- Power the machines again in any direction.
- The machines now communicate with one another and acquire an address. The LED (near the Dip-switches) of each machine begins to flash in relation to its address; ensure that the LEDs flash with different numbers of flashes (machine No.1 → 1 flash – pause - 1 flash - pause; machine No.2 → 2 flashes – pause – 2 flashes - pause). Repeat the procedure in case of error.
- Cut off power to the machines.
- Position dip-switches No.1 and No.2 according to the desired stroke (see the opening stroke-end table).
- Now the machines are synchronized. Connect the machines to the power supply again and carry out some opening and closing manoeuvres.

11.6. Light signals of the LED (for KATO Syncro³)

In case of a problem during installation or operation of the machines, consult the possible causes listed below:

LED Function	Meaning	Solution
1 flash – pause – 1 flash - pause	Overload due to an obstacle	Remove the obstacle
2 flashes – pause – 2 flashes – pause	Communication error	Check the connections between the machines
Continuous flash	General synchronism error	Check the settings of the dip-switches or repeat the procedure for alignment and address acquisition

12. CHECKING FOR CORRECT ASSEMBLY

- Check that the window has closed completely, even at the corners, and check there are no obstacles caused by assembly in the wrong position.
- Check that when the window frame is closed, the chain terminal is at least a couple of millimetres distant from the actuator body. This will ensure correct closure of the window with correct pressure on the weather stripping. If the chain terminal is not positioned as stated there is no guarantee the window will close correctly.
- Check that all attachments and support brackets are tightly fixed to the window frame and that all screws are correctly tightened.
- Check that the window moves to the desired position in accordance with the limit switch selected.
- Check that the gear motor support brackets are aligned and the four fixing screws are firmly screwed into position.

13. EMERGENCY MANOEUVRES, MAINTENANCE AND CLEANING

Should the window have to be opened manually in the event of no electricity, mechanical failure, or for normal maintenance or cleaning of the external surface of the window frame, the following instructions should be followed:

1. Release the rapid release hook locking the chain terminal to the bracket.
2. Hold the window with one hand and pull the pin out of the opening with the other hand (we recommend to do so with the opening of at least 10 cm to facilitate the release of the window) - Fig. 16.
3. Manually open the window frame.

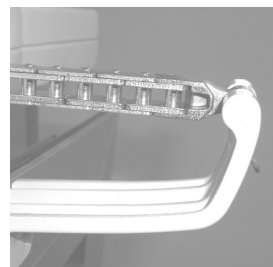


Figure 16



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

Please consult the following table for any eventual problems with function during installation or normal use:

<i>Problem</i>	<i>Possible cause</i>	<i>Solution</i>
Gear motor doesn't work.	<ul style="list-style-type: none">• No electricity supply for feeder.• Connecting cable not connected or wire not connected.• Feeder doesn't deliver foreseen tension (24V$\overline{---$).	<ul style="list-style-type: none">• Check state of safety switch.• Check all electrical connections of gear motor.• Possible transformer winding break down.
Although selection has been carried out correctly the gearmotor will not take a limit switch.	<ul style="list-style-type: none">• Programming hasn't been carried out correctly.• Irregular function or break in the electrical contact for the dip-switch.	<ul style="list-style-type: none">• Repeat programming for dipswitch.• Send gear motor to a Service Centre.

15. 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.

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 Italian 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 inexpert use.

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

17. DECLARATION OF INCORPORATION (for a partly completed machine) AND EC DECLARATION OF CONFORMITY

Hereby the

Manufacturer:	Nekos Srl Via Capitoni 7/5- 36064 Colceresa – VI – Italy Tel +39 0424 411011 – Email info@nekos.it
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declare under its own responsibility that the following products:

Product Designation:	Window chain drive
Type :	230 V : KATO 253 - KATO - KATO 305 KATO SYNCRO³ - KATO 305 SYNCRO³ INKA 356 - INKA 356 SYNCRO³ 24 V : KATO 253 - KATO - KIMO – KIMO 202 - KATO 305 KATO SYNCRO³ - KATO 305 SYNCRO³ INKA 356 - INKA 356 SYNCRO³

Year of manufacturing from: **2017**

Fulfil the essential requirements of the Machinery Directive 2006/42/EC, Annex I, Art. 1.1.2, 1.1.3, 1.1.5, 1.2.1, 1.2.3, 1.2.6; 1.3.2, 1.3.4, 1.3.9, 1.5.1, 1.5.2, 1.5.6, 1.5.7, 1.5.8, 1.5.9, 1.5.10, 1.5.11, 1.7.1, 1.7.1.1, 1.7.3, 1.7.4.2, 1.7.4.3 The relevant technical documentation is compiled in accordance with Annex VII, Part B
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The person authorised to compile the relevant technical documentation is: **Giuliano Galliazzo – Nekos S.r.l.**

In response to a reasoned request by the national authorities, we will provide, via e-mail, the relevant information on the product listed above within an adequate period proportional to its importance.

Furthermore the products listed above complies with the provisions of followings Directives:

<ul style="list-style-type: none">• 2014/30/EU ElectroMagnetic Compatibility Directive (EMCD)• 2014/35/EU Low Voltage Directive (LVD)• 2011/65/EU Restriction of the use of certain hazardous substances Directive (RoHS Directive)• 2015/863/EU Delegated Directive amending Annex II of Directive 2011/65/EU of the European Parliament and of the Council regarding the list of substances with usage restrictions
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and of the following harmonised standards and/or technical specifications:

EN 60335-2-103 ; EN 61000-6-3:2007 + A1:2011 + AC:2012; EN IEC 61000-6-2:2019 EN 60335-1:2012 + AC:2014 + A11:2014; EN 50581:2012
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Commissioning of the complete machinery including the above mentioned drives delivered by us is not allowed until it is ascertained that the installation of the complete machinery was performed in accordance with the specifications and the operating and installation advice given in our Mounting Instructions, and that the acceptance procedure was duly carried out and documented in an acceptance protocol by a specialist.




This is declared by the manufacturer:

NEKOS SRL - Via Capitoni 7/5 - 36064 Colceresa – VI – Italy

Represented by: **Giuliano Galliazzo – CEO**

Place and date: Colceresa **22/09/2021**


Valid signature

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