K-ECO S3

K-ECO S3 230V, K-ECO S3 Syncro³ 230V
K-ECO S3 24V, K-ECO S3 Syncro³ 24V

EN

INSTRUCTION MANUAL

CHAIN ACTUATOR

Force 250N – Maximum stroke 300 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.

Symbols used in the manual

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

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.

INSTALLER INSTRUCTIONS

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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 "dead man'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 to 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

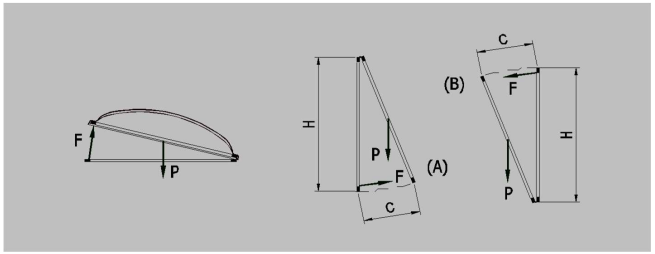
K-ECO S3 chain actuators performs opening and closing of the window sash using a double row steel chain inside a shell. Movement is generated using electrical energy that powers a reduction motor controlled by an electronic device. Opening and closing movement of the window sash is determined by the polarity of the power supply wires, depending on the wiring performed (*see wiring diagrams on page 12*). Windows can be programmed to open by means of a rotatory trimmer (*Rotary switch*) and the device allows chain opening at 100, 200, 300 mm.
When the window returns to start position, that is during closure, the stroke-end uses an electronic self regulating process with power absorption and no regulation is therefore required.
The actuator leaves the factory with the chain outside of about 1 cm. This allows the actuator to be assembled without electrical energy powering movements and leaving the window closed after assembly.
The joint between actuator and support brackets is quick, requires no fixing screws (***NEKOS*** patent) and allows the actuator to rotate in order 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 x P

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

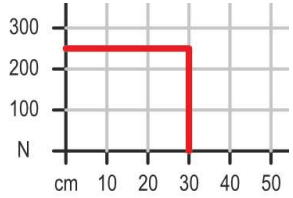
For vertical windows

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

F = 0.54 x P x C : H

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

The graphic shows the force (N) applied by the actuator in relation to the chain stroke (cm).



3.2. Maximum opening according to height of sash

The actuator stroke is in accordance with the height of the sash and its application.
Verify that the actuator chain does not touch the profile of the sash during its stroke, that no obstacles are present while opening and that the chain is not forcing the window frame.

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

Mode of installation of K-ECO S3	*Selection of actuator stroke*		
	100	***200***	***300***
	Minimum sash height		
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 inward windows *(motor on frame)*	**350**	**700**	**1300**
Bottom hung inward windows *(motor on sash)*	**Consult manufacturer**		

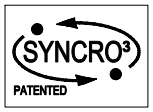
4. USE OF ACTUATOR IN 'SYNCRO³' VERSION

The chain actuator **K-ECO S3 Syncro³** is equipped with the NEKOS patented system which enables the coordinated synchronization of the chain movement.
Electronic control of speed is completely automatic and does not require any external control unit; simply connect the communication cables already present in the power cable to each other (*see diagram at page 12*) and proceed with the reset procedure.

4.1. Recognition

To recognise the Syncro³ version of the K-ECO S3 actuator, pay attention to 3 important differences:

- Label with Syncro³ mark *(see image on the side),*
- Data label with the "Syncro³" mark,
- Supply cable described as per chart of *page 12.*



4.2. When it has to be mounted on a window

The chain actuator K-ECO S3 Syncro³ is mounted when the window is particularly heavy or large *(approximately over 1.2 m)* and a single actuator doesn't allow the perfect frame closure, making in this way necessary to have two or more retention points.
Using a group of Syncro³ actuators, movement occurs uniformly, that is synchronized. In case one of the actuators stops because of any mechanical or electrical obstacle, the others will stop too, preserving in this way the integrity of the frame.
Please remind that force exerted by a set of actuators installed on the same sash is equal to the sum of the forces exerted by each actuator. When two actuators are mounted, the force exerted on the window frame is therefore doubled.

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

5. CONSTRUCTION AND STANDARDS

INTENDED USE. The chain actuator has been designed and manufactured to open and close top hung windows opening outwards, bottom hung windows opening inwards, dormer windows, light domes and skylights. Specific use is for ventilation and airing of areas; any other use is strongly discouraged. The supplier of the entire system is in any case solely responsible.

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 electrical network, 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 actuator is packed in one single carton which contains:

- 110-230V~ 50/60Hz or 24V ⎓ electrical actuator,
- Standard support brackets,
- Small parts packaging,
- Instruction manual.

Some brackets are available but not included in the package and have to be requested separately in function of the application:

- Bracket for bottom hung inward opening (*see paragraph 9.4*),
- Bracket for top hung outward opening (*see paragraph 9.5*),
- Bracket for top hung outward opening on windowsill (*see paragraph 9.6*).

IMPORTANT: The actuator in Syncro³ version is packed in a cardboard box with two units and all accessories. The actuator is shipped already tested, but the RESET procedure needs to be executed (see *chapter 12*).

When installing a system that requires the use of several Syncro³ actuators or a K-LOCK electromechanical lock (24V version), a new RESET procedure must be performed.

6. TECHNICAL DATA

Model ***K-ECO S3***	***230V***	***230V SYNCRO³***	***24V***	***24V SYNCRO³***
Force exerted by thrust and traction (F_N)	250 N			
Strokes (S_V)	100, 200, 300 mm			
Power supply voltage (U_N)	110-230V~ (AC)		24V⎓ (DC)	
Rated absorbed current (I_N)	0,14/0,08 A	0,25/0,14 A	0,50 A	
Power absorbed at nominal load (P_N)	~ 10 W	~ 13 W	~ 12 W	
No load speed (Opening/Closing)	5 mm/s	4.5 mm/s	6 mm/s	
Stroke duration at load *(300 mm)*	72 s	80 s	60 s	
Electrical insulation	Class II		Class III (Selv)	
Type of service	2 cycles		5 cycles	
Operating temperature	-20 - +70 °C			
Protection index for electrical devices	IP42			
Soft-stop function	Yes			
Relax function	Yes			
Adjustment of connection to window frame	Automatic definition of position			
Parallel powering of two or more motors	Yes (max. 20)			
Synchronised function	No	Yes (max 4)	No	Yes (max 8)
Holding nominal force *(it can vary according to the chosen brackets)*	1600 N			
Stroke-end at opening	Electronic by trimmer			
Stroke-end at closing	At absorption of power			
Overload protection	At absorption of power			
Length of power cable	2 m			
Dimensions	380x42x33,5 mm			
Weight	0,850 Kg		0,800 Kg	

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

7. ID PLATE AND MARKING DATA

The actuators K-ECO S3 e K-ECO S3 SYNCRO³ 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 actuator **K-ECO S3** is commercially available with three different supply cable types.

Two 230V versions with different cables for SOLO and SYNCRO³ models and two 24V versions with the same supply cable but with different function between SOLO and SYNCRO³ models (*see also chart at page 12*):

A. **K-ECO S3 230V**: runs on grid tension of 230V~ 50/60Hz, with a three wire cable (***LIGHT BLUE***, common neutral; ***BLACK***, phase open; ***BROWN***, phase closed);

B. **K-ECO S3 230V SYNCRO³**: runs on grid tension of 110-230V~ 50/60Hz, with a five wire cable (***LIGHT BLUE***, common neutral; ***BLACK***, phase open; ***BROWN***, phase closed). A fourth wire (***GREEN***) is for electronic synchronisation with other **SYNCRO³ 230V** actuators (***NEKOS*** Patent);

C. **K-ECO S3 24V - K-ECO S3 24V SYNCRO³**: runs on 24V⎓, with three wire cable *(**RED**, connected to the + (positive) closes; **Black**, connected to the + (positive) opens.* The third wire ***GREEN*** is used for the electronic synchronization with other **SYNCRO³** 24V⎓ actuators (NEKOS patent), or for the connection with K-LOCK electro locks and AUX devices.

Low tension actuators 24V⎓ can be powered using specific units with emergency battery or security feeder (Class III SELV) with an output tension of 24V⎓ *(min. 20.4V, max. 28.8V)*.

IMPORTANT: in K-ECO S3 SYNCRO³ actuators (230V and 24V) and K-ECO S3 24V, wire *GREEN* if not used must be insulated.

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 to correctly calculate the section of the conductors according to the length of the cables.

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

CABLE SECTION	Actuator fed at		
	24V ⎓	110V~	230V~
0.50 mm²	~20 m	~300 m	~1400 m
0.75 mm²	~30 m	~450 m	~2100 m
1.00 mm²	~40 m	~600 m	~2800 m
1.50 mm²	~60 m	~900 m	~4000 m
2.50 mm²	~100 m	~1500 m	~6800 m
4.00 mm²	~160 m	~2500 m	~11000 m
6.00 mm²	~240m	~3700 m	~15000 m

9. INSTRUCTIONS FOR ASSEMBLY

These instructions are intended for technical and specialised personnel, therefore fundamental working and safety techniques are not commented.

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 if following fundamental conditions are met:

9.1. Mounting warnings

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

ATTENTION. 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 moving the window without encountering any obstacle. The limits indicated in the technical data chart must not be overcome *(page 8).* In opposite case the most appropriate stroke should be selected. Calculations can be checked using the formula indicated of *page 5*.

Make sure that the actuator has not been damaged during transport.

Check that the inside width of the window (where the actuator has to be mounted) is over 420 mm, otherwise the actuator can not be mounted.

Once the actuator has been installed check if the distance between the fixed part of the window frame (where the actuator has to be mounted) and the mobile part of the window frame (where the bracket has to be fixed) is greater than or equal to 0 mm. If this is not the case, the proper functionality of the actuator is not assured as the window will not close correctly. If required, add additional thickness below the support brackets to reset the quota.

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

IT IS NECESSARY to preview an appropriately sized flexible link arm or a fall protection system suitably sized to withstand any accidental fall of the window.

9.2. Actuator preparation for assembly

In case of doubt, uncertainty or in case of different applications, please contact the manufacturer. For correct assembly, carefully follow the instructions below.

Before starting the assembly of the actuator, it is necessary to prepare following material for completion, equipment and tools:

- For fixing onto metal window frames: M5 threaded inserts (9 pieces), M5x12 flat headed metric screws (9 pieces).
- For fixing onto wooden window frames: self threading screws for wood Ø4.5 (9 pieces).
- For fixing onto PVC window frames: self threading screws for metal Ø4.8 (9 pieces).
- Equipment and tools: measuring tape, pencil, drill/screwdriver, set of drill heads for metal, insert for screwing in, electricians pliers, screwdrivers.

Attention. To avoid possible motor damages and health dangers please accurately choose the fixing screw length, trying not to harm the supply cables during the assembly.

9.3. Calculating the number of push / retention points

If the window has a width exceeding 120 cm, it is advisable to use several push / retention points by assembling several actuators (Syncro³ version).

The simple formula below allows you to calculate the position of these points.

Formula:

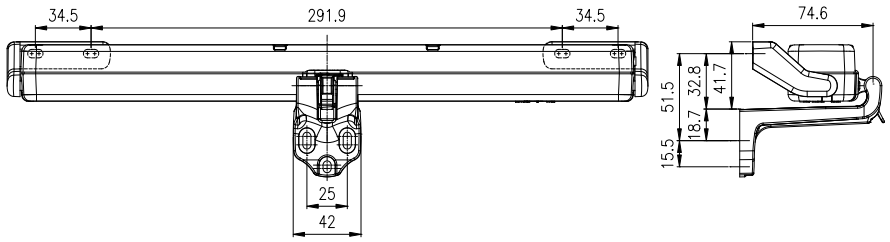
The two side dimensions - **LA : (PA x 2) = QL**
The central dimensions - **QL x 2**

Legend:

***LA** = Window Sash Width (hinges side)*
***PA** = Actuator Attachment Points*
***QL** = Side Dimensions*

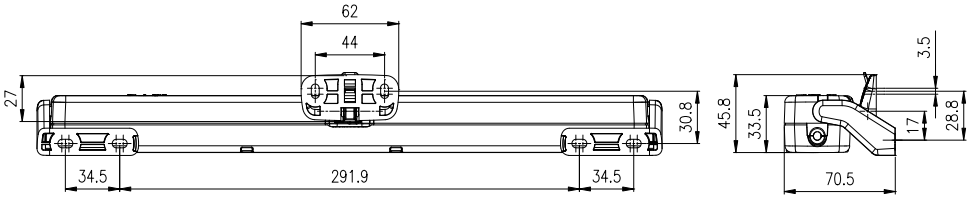
9.4. Bottom hung, inward, mounting scheme

Window with hinges at the bottom, opening inwards from the top.



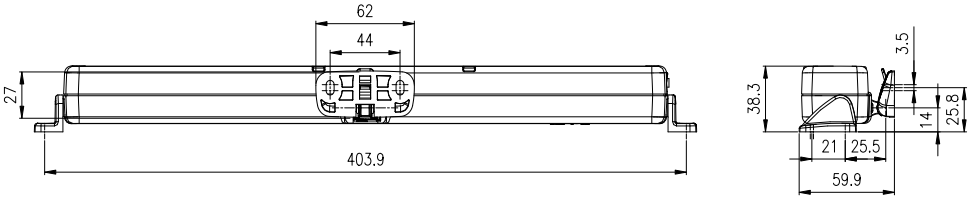
9.5. Top hung, outward, mounting scheme

Window with hinges at the top, opening outwards from the bottom.



9.6. Top hung, outward, mounting scheme on windowsill *(Vertical Mounting)*

Window with hinges at the bottom, top or hinged, internal and/or external opening.



10. ELECTRICAL CONNECTIONS

Actuators are equipped with cable manufactured in accordance with safety standards and protection against radio disturbances.

EACH ACTUATOR MODEL MUST BE EQUIPPED WITH ITS OWN SPECIFIC CABLE.

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

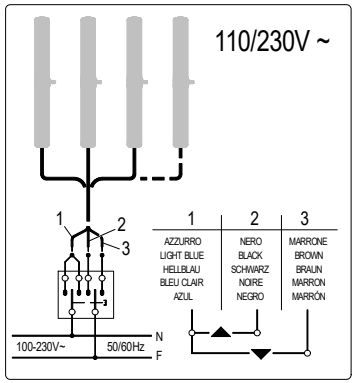
Tension	Cable length	Number of wires	Feeder wires	Communication wires
110-230V~ 50/60Hz	2 m	3	LIGHT BLUE BLACK BROWN	-
110-230V~ 50/60Hz (Syncro³)	2 m	4	LIGHT BLUE BLACK BROWN	GREEN
24V ⎓	2 m	3	RED, BLACK	GREEN
24V ⎓ (Syncro³)	2 m	3	RED, BLACK	GREEN

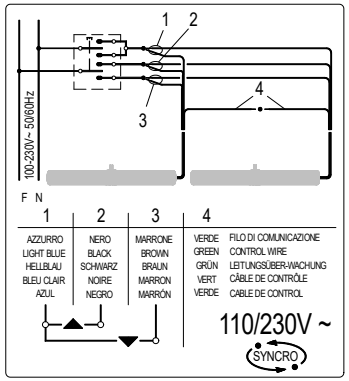
10.1. Electrical connection for 110/230V~ 50/60 Hz version

The cable supplied with the actuator is calculated in accordance with safety regulations.

Regarding the K-ECO S3 Syncro³ version, the Electrical connection of the communication wires should be performed using a simple appropriately sized bell clamp (supplied with the appliance).
Secure and stabile connections with good electrical contact (copper to copper) are vital to avoid communication disturbs, because the passage voltage is very low.
The max. length of the communication wires does not have to exceed 10 meters.

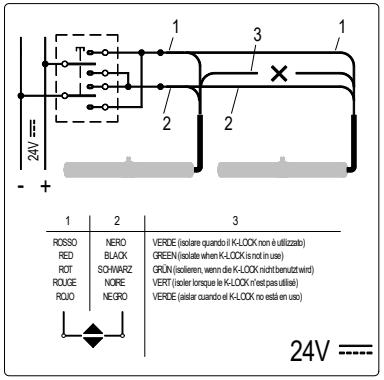
110/230V ~ wiring schema.

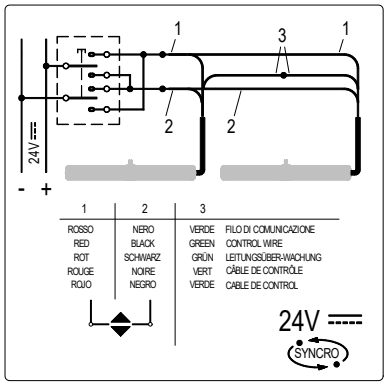




10.2. Electrical connection for 24V version

24V ⎓ wiring schema.

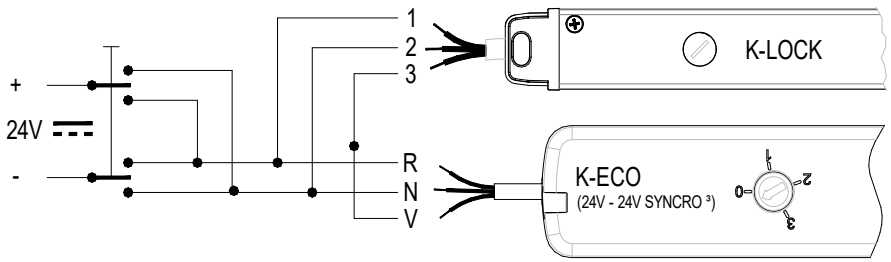




IMPORTANT: in K-ECO S3 SYNCRO³ (230V and 24V) and K-ECO S3 24V actuators, wire GREEN "3" if not used must be insulated.

10.2.1. Electrical connection with K-LOCK electromechanical lock

The diagram below indicates the wiring with K-LOCK electromechanical lock *(just for actuators version K-ECO S3 24V and K-ECO S3 24V SYNCRO³)*:



Before activating the actuator, it is important to know the meaning of the flashing signals emitted by the BLUE, RED, GREEN and ORANGE light of the selector *(see specifications in paragraph 12.3).*
In this way it is possible to verify the correct functioning of the machine or to recognize possible anomalies.
The selector light is visible only when the actuator is powered on.

***IMPORTANT:** If feeder cables require extending to the control button for low voltage actuators (24V⎓), cable sections should be selected accordingly. Conductor sections are indicated in the table on page 9.*

11. PROGRAMMING THE ACTUATOR

11.1. Closing end stroke

The closing end stroke is automatic and non-settable. The position at which the actuator stops is determined by the power absorbed by the actuator when the window reaches the complete closure and the seals are completely compressed, i.e., the actuator stops when the power absorbed exceeds a pre-set threshold.

After each closing or intervention of the electronic protection, the chain slightly moves in the opposite direction. This is necessary to relax the mechanical parts and to grant the right compression of the seals.

During operation, the K-ECO S3 actuators automatically recognize and memorize the distance between window sash and frame when the window is completely closed. The difference in the position of the protruding part of the window sash with respect to the frame is defined as the "overlap" and allows the actuator to acquire its own operating parameters, storing the position and type of window frame.

This procedure, known as "OVERLAP ACQUISITION" *(paragraph 12.2)*, occurs the first time the actuator closes the window completely following a RESET operation and remains stored as an operating parameter.

11.2. Opening end stroke

K-ECO S3 actuator is supplied with the RESET procedure already executed and a pre-set maximum stroke. The overlap acquisition procedure (*paragraph 12.2*) still needs to be performed so as the selection of a smaller stroke if necessary.

IMPORTANT: If the K-LOCK electromechanical lock is connected, a new RESET procedure must be performed.

In case the actuator is used in Syncro³ configuration, the **RESET** and overlap acquisition procedures shall be performed during the installation (*chapter 12*) before selecting the desired opening end stroke.

Check the electrical wiring before starting a **RESET** procedure.

If the settings are lost, a new RESET and subsequent overlay acquisition procedure must be performed.

By moving the rotary switch to positions **1-2-3** (see table in next chapter) it's possible to choose one of the three chain opening strokes.

Position "0" is reserved to the selection of the RESET procedure.

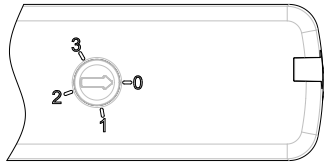
12. RESET PROCEDURE

The RESET procedure regards one single actuator; or a group of parallel connected actuators or actuators connected in Syncro³ modus.

The procedure must be operated while the chain terminal (or terminals, in case of configuration implying more than one device) is released from the sash bracket.

IMPORTANT: The trimmer adjustment must be carried out while the actuators are not powered; after each modification it is necessary to wait a few seconds (~10 sec) before feeding the actuators again, so that the modification becomes effective.

TRIMMER POSITION	*SETTING*
0	**RESET**
1	100 mm STROKE
2	200 mm STROKE
3	300 mm STROKE



12.1. RESET procedure for K-ECO S3 actuators

Follow these procedures in succession:

a. Perform the electrical wiring among all present devices.

b. If the K-LOCK electro-lock is present, make sure that its dip-switches are correctly set. See relative instruction manual.

c. Position the rotary switch to 0. In case of configuration with several Syncro^3 actuators this must be performed on one actuator only, the others shall maintain a strictly different setting (**1, 2,** or **3**).

d. Power on the actuators (opening or closing is indifferent). The initialization phase starts.

e. In case the K-LOCK lock is present, the actuator(s) wait for about 8 seconds, until the lock moves to the "open" position, before moving the chain. If there is no lock connected, the actuator moves immediately to closing direction and the chain retracts completely. In fully automatic mode, an opening manoeuvre of about 5 cm will follow. During this phase make sure that there are no obstacles to the movement of the chain and wait for the completion of the procedure on all the actuators.

f. At the end of the process, each connected device's (also the electro-lock K-LOCK if present) LED will flash indicating the successful execution of the RESET procedure.

   Each device will give a different number of flashes to indicate the unique address acquired by itself in the system (actuator 1 → 1 flash → pause → 1 flash → pause; actuator 2 → 2 flashes → pause → 2 flashes → pause, etc.).

g. Switch off the power supply to the devices and set the rotary switch, which was previously in position 0, on the new travel position **1, 2** or **3.** In case of several actuators it is necessary to set the same desired stroke in all of them (*as shown in the table in chapter 12*).

h. Hook the chain end to the previously unhooked sash bracket for all the actuators.

Each time a RESET procedure is performed, the actuator will automatically repeat the overlap acquisition operation at the next complete closure, as specified below.

12.2. The overlap acquisition operation

The following procedure describes how to perform the overlap acquisition (RESET procedure already performed). **The max. acquirable overlap dimension is 30 mm.**

- Installation of the actuator(s) on the window frame (*see chapter 9*);
- Electrical connection of the actuator (*see chapter 10*);
- Connection of the chain terminal(s) to the sash bracket.
- Execution of the command to close the window.
- Wait for the window to be completely closed and if the overlap is acquired correctly, the actuator will emit a long flash (lasting more than 1,5 sec.)

IMPORTANT: If, for any reason, the actuator has not correctly closed the window completely and stops before finishing its stroke, the RESET operation and the overlap acquisition procedure shall be repeated in sequence until the procedure is correctly completed.

When the window is closed, check that the chain terminal protrudes completely from the actuator body by at least a couple millimetres; this ensures that the window is closed well and the seal is compressed properly, otherwise there is no certainty that the window is completely closed.

Also make sure that connections and support brackets are stiffly connected to the window and that the screws are correctly tightened.

The use of self-threading or self-drilling screws is not recommended on aluminium windows and doors because they would risk to tear off the profile after a few manoeuvres; use metric screws with threaded inserts (*see instructions on paragraph 9.2*).

12.3. K-ECO S3 230V LED light signals

Below the tables reporting the information corresponding to the **BLUE LED** flashes of the **K-ECO S3 230V** and their relative error meaning.

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

BLUE LED (K-ECO S3 230V)		
Number of Flashes	***Type of Error***	***Possible Solution***
1	***Overload error during opening:*** *The actuator has detected a motor overcurrent*	Check if there are obstacles preventing the actuator from completing its stroke. Check the correct actuator installation.
2	***Overload error during closing:*** *The actuator has detected a motor overcurrent*	Check if there are obstacles preventing the actuator from completing its stroke. Check the correct actuator installation.
3	***Encoder error:*** *The internal encoder is not detected*	Repeat the RESET procedure
4	***RESET Procedure error:*** *The RESET procedure was not completed successfully or was interrupted.*	Repeat the RESET procedure
5	***Memory error:*** *The internal memory writing process has failed.*	Repeat the RESET procedure

BLUE LED status indication for **K-ECO S3 230V**:

with BLUE LED	
LED status	***Meaning***
STEADY-ON Duration < 0.5 sec.	*Internal memory writing process in progress.*
STEADY-ON	*RESET Procedure in progress.*
STEADY-ON for 3 sec.	*Overlap acquisition procedure finished correctly.*
FLASHING	*RESET Procedure finished correctly.*

12.4. K-ECO S3 24V LED light signals

Below the tables reporting the information corresponding to the various LED flashes of the **K-ECO S3 24V** and their relative error meaning.

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

RED LED:

with RED LED (K-ECO S3 24V)		
Number of Flashes	***Type of Error***	***Possible Solution***
1	***Current overload error:*** *The actuator has detected a motor overcurrent*	Check if there are obstacles preventing the actuator from completing its stroke. Check the correct actuator installation
2	***Communication error:*** *Communication between the devices is interrupted, or the devices being used have undergone the RESET procedure separately*	Check the condition of the connection cables, and repeat the RESET procedure if necessary
3	***Electro-lock error***	Check the electro-lock
4	-	-
5	***RESET Procedure error:*** *The RESET procedure was not completed successfully or was interrupted*	Repeat the RESET procedure
6	-	-
7	***Encoder error:*** *The internal encoder is not detected*	Repeat the RESET procedure
8	***Electric power supply error:*** *The power supply voltage is out the permitted range or is unstable*	Check the electrical contacts at the ends of the actuator cable and ensure that the power supply is correct
9	-	-
10	***Memory error:*** *The internal memory writing process has failed*	Repeat the RESET procedure
11	***Connection error:*** *A RESET procedure is being started with actuators different than Syncro³*	Check the type of actuators chosen for the system. Repeat the RESET procedure

GREEN AND ORANGE LED STATUS:

with GREEN LED (K-ECO S3 24V)	
LED Status	***Meaning***
STEADY-ON	*Device powered correctly. The device has executed a chain re-entry stroke correctly, completing the operation by writing the memory, or it is still in motion.*
FLASHING	*Device powered correctly. The device has executed an outgoing stroke of the chain correctly. The number of flashes indicates the number previously assigned to the device during the RESET procedure.*

with ORANGE LED (K-ECO S3 24V)	
LED Status	***Meaning***
STEADY-ON Duration < 0.5 sec.	*Internal memory writing process in progress.*
STEADY-ON	*RESET Procedure in progress.*
STEADY-ON for 3 sec.	*Overlap acquisition procedure finished correctly.*
FLASHING	*RESET Procedure finished correctly. The number of flashes indicates the address assigned to the device in a configuration with several devices.*

12.5. K-ECO S3 230V SYNCRO³ and 24V SYNCRO³ LED light signals

Below the tables showing the flash indications provided by the LED installed on the actuators **K-ECO S3 230V SYNCRO³ and K-ECO S3 24V SYNCRO³** with their meaning.

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

RED LED:

with RED LED		
Number of Flashes	***Type of Error***	***Possible Solution***
1	***Current overload error:*** *The actuator has detected a motor overcurrent.*	Check if there are obstacles preventing the actuator from completing its stroke. Check the correct actuator installation.
2	***Communication error:*** *Communication between the devices is interrupted, or the devices in use have undergone a RESET procedure separately.*	Check the condition of the connection cables, and repeat the RESET procedure if necessary.
3	***Electro-lock error***	Check the electro-lock.
4	***Contrasting Dip-switch settings:*** *The devices connected to each other have conflicting Dip-switch settings.*	Check the settings of the various Dip-switches.
5	***RESET Procedure error:*** *The RESET procedure was not completed successfully or was interrupted.*	Repeat the RESET procedure.
6	***Wiring error:*** *The power supply cables of the devices configured in Syncro³ are inverted.*	Check and correct the wiring.
7	***Encoder error:*** *The internal encoder had a counting error*	Repeat the RESET procedure.
8	***Electric power supply error:*** *The power supply voltage is out the permitted range or is unstable.*	Check the electrical contacts at the ends of the actuator cable and ensure that the power supply is correct.
9	***Chain alignment error:*** *The misalignment of the chain terminal positions on devices connected in a Syncro³ configuration exceeds the maximum value allowed.*	Repeat the RESET procedure.
10	***Memory error:*** *The internal memory writing process has failed.*	Repeat the RESET procedure.
11	***Connection error:*** *A RESET procedure is being started with actuators different than Syncro³*	Check the actuator types chosen for the system. Repeat the RESET procedure.

GREEN AND ORANGE LED STATUS:

with GREEN LED	
LED Status	***Meaning***
STEADY-ON	*Device powered correctly.* *The device has executed a chain re-entry stroke correctly, completing the operation by writing the memory, or it is still in motion.*
FLASHING	*Device powered correctly. The device has executed an outgoing stroke of the chain correctly. The number of flashes indicates the number previously assigned to the device during the RESET procedure.*

with ORANGE LED (RED - GREEN)	
LED Status	***Meaning***
STEADY-ON **Duration < 0.5 sec.**	*Internal memory writing process in progress.*
STEADY-ON	*RESET Procedure in progress.*
STEADY-ON **for 3 sec.**	*Overlap acquisition procedure finished correctly.*
FLASHING	*RESET Procedure finished correctly. The number of flashes indicates the address assigned to the device in a configuration with several devices.*

13. 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 actuator support brackets are aligned and the four fixing screws are firmly screwed into position.

14. 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 NEKOS patent allows rapid unhooking of the chain.

To perform this operation, follow the points below:

a) Release the rapid release hook locking the chain terminal to the bracket.

b) Hold the window with one hand and pull the pin out of the opening with the other hand *(we recommend to perform this operation making sure the opening is of at least 10 cm to facilitate the release of the window)*.

c) Manually open the window frame.

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

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

15. TROUBLESHOOTING

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

Problem	*Possible cause*	*Solution*
The actuator doesn't work.	• No electricity supply for feeder. • Connecting cable not connected or wire not connected. • Feeder doesn't deliver foreseen tension (24V⎓).	• Check state of safety switch. • Check all electrical connections of the actuator • Possible transformer winding break down.
Although selection has been carried out correctly the actuator will not take a limit switch.	• Programming hasn't been carried out correctly • Irregular function or break in the electrical contact of the trimmer	• Repeat the RESET procedure • Send the actuator to a Service Centre.

16. 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.

17. 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 inexpert use.

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

18. DICHIARAZIONE DI INCORPORAZIONE (per una quasi macchina) e DICHIARAZIONE CE DI CONFORMITÀ / *Declaration of Incorporation (for a partly completed machine) and EC Declaration of Conformity*

Con la presente il / H*ereby the*

Costruttore: *Manufacturer:*	**NEKOS S.r.l.** 36064 Colceresa – VI – ITALY Tel +39 0424 411011 – Email info@nekos.it

dichiara sotto la propria responsabilità che i seguenti prodotti:
declare under its own responsibility that the following products:

Descrizione prodotto : *Product Designation:*	**Attuatore a catena per finestre** *Window chain drive*
Modello: *Type :*	**230 V : K-ECO S3 230V – K-ECO S3 230V SYNCRO³** **24 V : K-ECO S3 24V – K-ECO S3 24V SYNCRO³**

Anno di costruzione dal / *Year of manufacturing from:* **2020**

Soddisfano gli applicabili requisiti essenziali della **Direttiva Macchine 2006/42/EC, Allegato I**
*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**
La documentazione tecnica pertinente è compilata secondo l'**Allegato VII, sezione B**
*The relevant technical documentation is compiled in accordance with **Annex VII, Part B***

La persona autorizzata a costituire la documentazione tecnica pertinente è:
The person authorised to compile the relevant technical documentation is: **Giuliano Galliazzo – Nekos S.r.l.**

Su richiesta adeguatamente motivata delle autorità nazionali, la documentazione tecnica dei citati prodotti sarà resa disponibile, via e-mail, entro un tempo compatibile con la sua importanza.
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.

Inoltre i succitati prodotti sono conformi alle disposizioni pertinenti delle seguenti Direttive:
Furthermore the products listed above complies with the provisions of followings Directives:

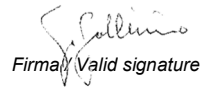
- **2014/30/EU Direttiva Compatibilità Elettromagnetica** / *ElectroMagnetic Compatibility Directive (EMCD)*
- **2014/35/EU Direttiva Bassa Tensione** / *Low Voltage Directive (LVD)*
- **2011/65/EU Direttiva sulla restrizione dell'uso di determinate sostanze pericolose nelle apparecchiature elettriche ed elettroniche (Direttiva RoHS)** / *Restriction of the use of certain hazardous substances Directive (RoHS Directive)*
- **2015/863/EU Direttiva Delegata recante modifica dell'allegato II della Direttiva 2011/65/UE del Parlamento Europeo e del Consiglio per quanto riguarda l'elenco delle sostanze con restrizioni d'uso** / *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*

e delle seguenti norme armonizzate e/o specifiche tecniche:
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;**

La messa in moto di una macchina completa che includa la quasi macchina sopra menzionata, da noi fornita, non è permessa finché non sia accertato che l'installazione sia stata fatta secondo le specifiche e le indicazioni di installazione contenute nel "Manuale d'istruzioni" fornito con la quasi-macchina e che sia stata espletata e documentata, in apposito protocollo, una procedura di accettazione da parte di un tecnico abilitato.
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.

Questa dichiarazione è fatta dal costruttore / *This is declared by the manufacturer:*
NEKOS S.r.l. - Via Capitoni 7/5- 36064 Colceresa (Vicenza) - Italy
Rappresentato da / *Represented by:*
Giuliano Galliazzo – A.D. / *CEO*



Firma / Valid signature

Luogo e data / *Place and date*: Colceresa **22/09/2021**

Notes

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