INKA 356

INKA356 230V, INKA356 230V Syncro³, INKA356 24V, INKA356 24V Syncro³

EN

INSTRUCTION MANUAL

CHAIN ACTUATOR

Force 350N – Strokes 300, 600, 800, 1000 mm

Electrical feeding 100-240V~ 50/60Hz – 24V⎓

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.*
	INFORMATION	*This information give further suggestions.*
	ATTENTION	*This indication draw the attention about potential dangers for the product itself.*
	WARNING	*This indication draw the attention about potential damages to goods.*
	ENVIRONMENTAL INSTRUCTION	*Environmental indication draw the attention about potential dangers for the environment.*

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1. SECURITY RULES

PLEASE NOTE: IMPORTANT SAFETY INSTRUCTIONS. CAREFULLY OBSERVE ALL THE FOLLOWING INSTALLATION INSTRUCTIONS TO ENSURE PERSONAL SAFETY. IMPROPER INSTALLATION CAN SERIOUSLY ENDANGER SAFETY. KEEP THESE INSTRUCTIONS AFTER INSTALLATION.

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 should 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.

MAINTENANCE and REPAIRS

Periodically check the installation by inspecting the cables, springs, rods and mechanical parts for wear or damage. Do not use if repair or adjustment is required.

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

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

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

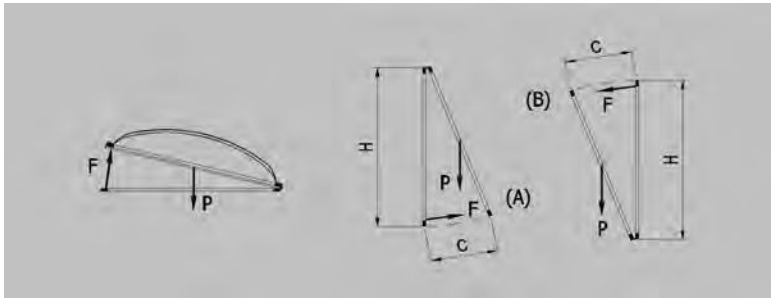
In the event of any problems or queries, consult your agent or contact the manufacturer directly.

2. FORMULAS AND RECOMMENDATIONS FOR INSTALLATION

2.1. Calculation of opening / closure force

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

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



For horizontal light domes or skylights

F = 0,54 x P

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

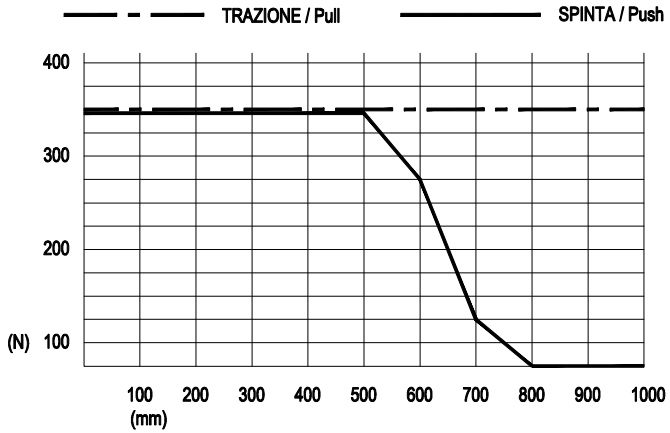
For vertical windows

- **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 chart below shows the force executed from the actuator in function of the stroke and type of mounting.



2.2. Maximum opening according to height of sash

The actuator can be recessed mounted in the frame as well as outside on the frame or on the sash. In any case the actuator stroke is in accordance with the height of the sash and its application. Check that, during stroke, the actuator chain does not touch the profile of the sash and that there are no obstacles for the opening or it does not exert force on the window frame.

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

Mode of installation	***Selection of actuator stroke***			
	300	***600***	***800***	***1000***
Light domes, skylights or vertical top hung windows opening outwards with frontal assembly	**350**	**650**	**900**	**-**
Top hung windows opening outwards with horizontal assembly	**350**	**650**	**900**	**-**
Bottom hung windows *(motor on frame)*	**400**	**800**	**1200**	**1350**
Bottom hung windows *(motor on sash)*	**Consult manufacturer**			

3. 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 a group of actuators (up to eight at the same time). Electronic control of speed is completely automatic device inside the actuator and does not require any external control station: just connect the feeder cable communication wires to each other *(see diagram on page 15-16)* and carry out reset procedure.

3.1. Recognition

Three elements differentiate the SYNCRO³ version of the actuator from other actuators in the INKA 356 series:

- The technical data label with the "..... **SYNCRO³**" label.
- The SYNCRO label to one side of the technical data label on the actuator.
- Only for 100-240V~ version, the electrical cable with 5 wires *(3+2)*.

3.2. Use of a Syncro³-version actuator

The Syncro³ version of the actuator is used when the window is particularly heavy or wide *(more than approximately 1.2 m wide)* and a single actuator doesn't allow complete closure of the window, especially in the corners, therefore making it necessary to have two or more retention points.

When a group of Syncro³ actuators is used, the movement of the window sashes occurs in a synchronized manner, i.e., uniformly without interruptions and/or variations in the speeds of the actuators. If one of the actuators stops, due to mechanical obstruction or an electronic problem, the other actuators stop as well, thereby guaranteeing the integrity of the window.

Recall that the force exerted by a group of actuators installed on the same window sash is equivalent to the sum of the forces exerted by each actuator; so assembling two actuators doubles the force exerted on the window.

IMPORTANT. When calculating the dimensions of a system with multiple Syncro³ actuators we recommend considering the force of each actuator as 90% of that stated on the ID plate.

4. GENERAL INFORMATION ABOUT THE ACTUATOR

The actuator of the INKA 356 series moves the window by means of a chain that runs inside the device. The chain is moved by a gearmotor driven by an electric motor, which in turn is powered and controlled by an electronic card. The opening and closing movement is determined by the polarity of the power supply wires depending on how the wiring is carried out (see wiring diagrams on page 15).

The position of the chain's stopping point for the closing stroke-end (re-entry of the chain) is self-determined by power absorption; therefore no adjustments are required for closing.

The actuator leaves the factory with the chain protruding about 1 cm from the re-entry stroke-end to facilitate its assembly on the window.

The actuator is coupled to the support brackets by means of a (Nekos patented) quick-connect coupling, without clamping screws, that allows the actuator to rotate in order to follow the chain's stroke, even on windows with reduced height.

5. TECHNICAL DATA

Model	***INKA356 230V***	***INKA356 230V SYNCRO³***	***INKA356 24V***	***INKA356 24V SYNCRO³***
Force exerted by thrust and traction	350 N (see force chart)			
Strokes *(can be selected at any time)*	**300** (100,200) – **600** (400,500) – **800** (600,700) – **1000** (800,900)			
Power supply voltage	100-240V~ 50/60Hz		24V⎓	
Rated absorbed current	0,33 – 0,22 A (230V)		0,950 A	
Power absorbed at nominal load	27-29 W		23 W	
No load speed	11 / 9,5 mm/s			
Duration of no load stroke	Stroke 300/600/800/1000 = 28/54/72/90 s			
Double electrical insulation	Yes		low voltage	
Type of service	S_2 of 3 min			
Operating temperature	-20 +70 °C			

Protection index for electrical devices	IP32			
Soft-stop function	Yes			
Relax function	Yes			
Adjustment of connection to window frame	Position self-determining			
Parallel powering of two or more motors	Yes (max 10)			
Synchronised function	No	Yes (Syncro³) max 8	No	Yes (Syncro³) max 8
Holding nominal force *(it can vary according to the chosen brackets)*	1.800 N			
Stroke-end at opening	Electronic by dip-switch setting			
Stroke-end at closing	At absorption of power			
Signalling 'window open/window closed'	Yes, with specific device to request at order			
Type and length of power cable	H05VV-F – 2m	FRR/2 – 2,5 m	S-FG4GA/2 – 2 m	ST/EI2 – 2 m
Dimensions	34,6x37 L468/624/727/824		34,6x37 L408/564/667/764	
Weight	0,9 / 1,4 / 1,8 / 2,2 kg		0,8 / 1,3 / 1,7 / 2,1 kg	

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

6. CONSTRUCTION AND REGULATORY REFERENCES

INTENDED USE The actuator is designed and built to move awning windows, bottom-hung windows, parallel-opening windows, light domes, dormer windows and skylights. Its use is specifically intended for ventilation and natural air conditioning of rooms (230V~ version), while the 24V⎓ version is intended for smoke and heat exhaust systems controlled by appropriate control units (RWA assembly group must be expressly required at the moment of the order); 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 EC Directives and 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 actuator is individually packaged in a cardboard container and each pack contains:

- 100-240V~ 50/60Hz or 24V⎓ electrical actuator.
- Instructions manual.
- Installation accessories (if requested).

Brackets are not included in the parcel and have to be requested separately in function of the applications.

IMPORTANT. The Syncro³ version of the actuator is packed in a cardboard box with two units and is shipped already tested. However, the RESET procedure must still be performed *(see section 12.2)*.
When installing a system that requires the use of several Syncro³ actuators or a K-LOCK electro-lock, a new RESET procedure must be performed.

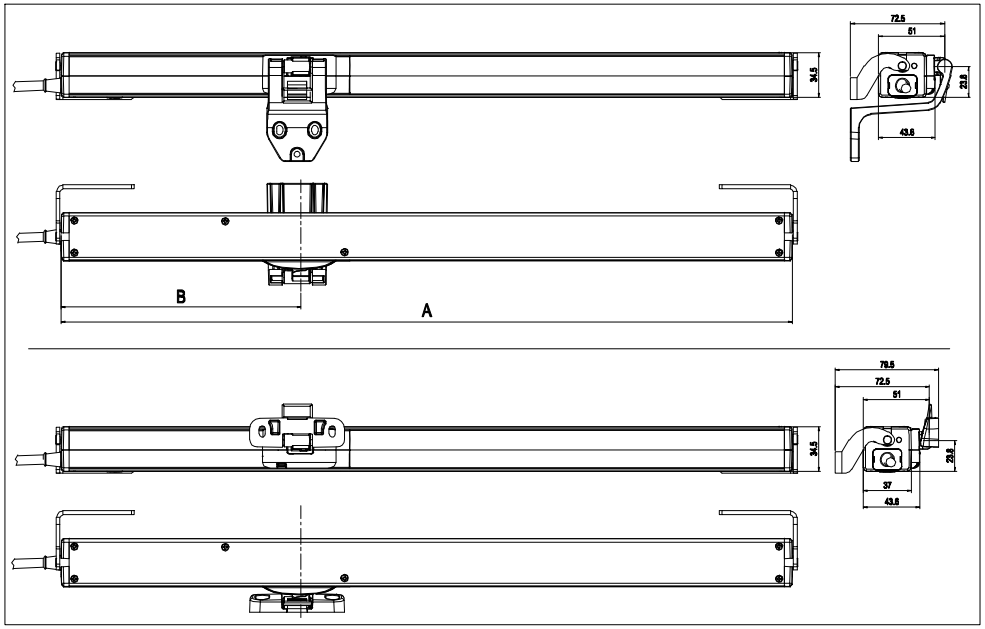
7. ID PLATE AND MARKING DATA

The Machine Directive classifies actuators as “partly completed machinery” and they are supplied with a Declaration of Incorporation, attached to this booklet; with regard to the electrical side, they bear CE marking and come under the LVD and CEM Directives and the other Regulations listed in the attached Declaration of Conformity. With this marking, the actuators can be sold and used throughout the European Union with no further requirements. The plate data is displayed on an adhesive label placed on the outside of the container, printed in black on a grey background.

8. ACTUATOR DIMENSIONS

The main overall dimensions of the actuator are given in the table below for bottom-hung and awning sashes. However, for perfect application on the window, it is advisable to request the drawings in order to determine the best solution.

Model	*Stroke (mm)*	*Dimensions (mm)*		*Chain axis fixed dimension (dimension B)*
		Cross-section	*Length (dimension A)*	
INKA 356 24V	300	34.5x37	408	185
	600		564	
	800		667	
	1000		764	
INKA 356 230V	300		468	245
	600		624	
	800		727	
	1000		824	



9. ELECTRICAL POWER SUPPLY

The actuator is commercially available in four versions identified according to electrical specifications:

1. **INKA356 230V**: runs on grid tension of 100-240V~ 50/60Hz, with a three wire cable *(**LIGHT BLUE**, common neutral; **BLACK**, phase open; **BROWN**, phase closed)*.
2. **INKA356 SYNCRO³ 230V**: runs on grid tension of 100-240V~ 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. **INKA356 24V**, for smoke and heat extraction: runs on 24V⎓, with three wire cable, ***BLACK “1”**, connected to the + (positive) closes; **BLACK “2”**, connected to the + (positive) opens*. A third wire ***BLACK “3”**,* is used for the possible connection to K-LOCK electromechanical lock.
4. **INKA356 SYNCRO³ 24V**, like the previous actuator, this version is destined for the smoke and heat extraction: and runs on 24V⎓, with three wire cable, ***BLACK “1”**, connected to the + (positive) closes; **BLACK “2”**, connected to the + (positive) opens*. A third wire ***BLACK “3”**,* is both used or electronic synchronisation (Nekos patent) and for the possible connection to K-LOCK electromechanical lock.

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

IMPORTANT: in 24V⎓ actuators, wire Black “3” if not used must be insulated and never connected.

9.1. Selection of power cable section

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

Cable section	*Maximum cable length*
4.00 mm²	~ 180 m
2.50 mm²	~ 110 m
1.50 mm²	~ 70 m
0.75 mm²	~ 35 m
0.50 mm²	~ 23 m

10. 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.

10.1. Warning

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).

Actuator specifications must be sufficient for movement of the window without encountering any obstacle. The limits indicated in the technical data table must not be superseded *(page 7)* and the most appropriate stroke should be selected. Calculations should be checked using the formula indicated on page 5.

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

Ensure that the actuator has not been damaged during transport.

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

Check that once the actuator has been installed the distance between the fixed part of the window frame (where the actuator is to be assembled) and the mobile part of the window frame (where the bracket is to be fixed) is greater than or equal to 0 mm (Fig. 1 and 8). 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.

10.2. 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 *(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.

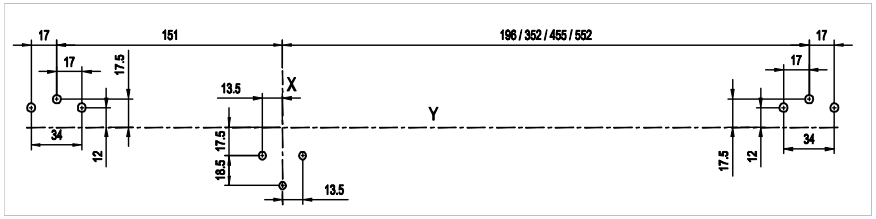
10.3. Calculation of the number of push / retention points

If the window has a width exceeding 120 cm, it is advisable to use several push / retention points by assembling several actuators. The simple formula below allows you to calculate the position of these points.

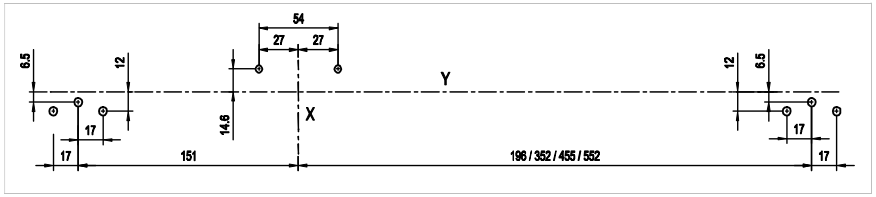
Formula:	*Legend:*
The two side dimensions - **LA : (PA x 2) = QL**	***LA** = Window Sash Width (hinges side)*
The central dimensions - **QL x 2**	***PA** = Actuator Attachment Points*
	***QL** = Side Dimensions*

10.4. Screw holes for support brackets and sash hinges

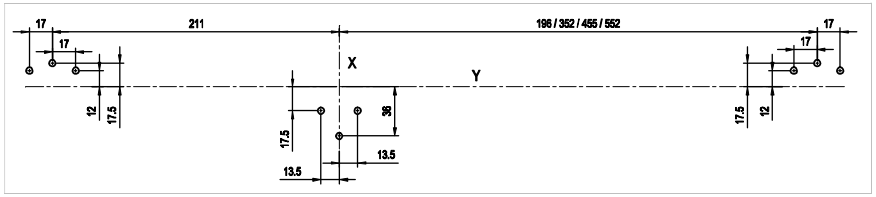
- Screw holes for low-voltage actuators (24V⎓) on bottom-hung windows (hinges at the bottom, opening inwards from the top).



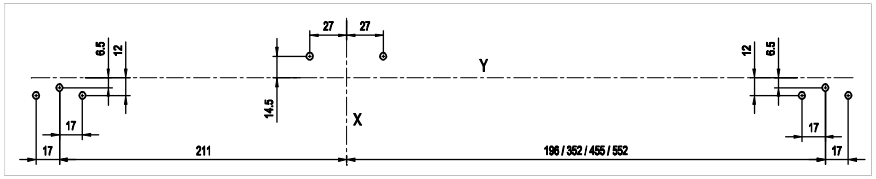
- Screw holes for low-voltage actuators (24V⎓) on awning windows (hinges at the top, opening outwards from the bottom).



- Screw holes for 100-240V~ actuators on bottom-hung windows (hinges at the bottom, opening inwards from the top).



- Screw holes for 100-240V~ actuators on awning windows (hinges at the top, opening outwards from the bottom).



10.5. Assembly with opening outwards – top hung, lower part opening towards the exterior

For any doubts, uncertainties or applications other than those described here, please contact the manufacturer.
To ensure correct assembly, carefully follow the instructions provided below.

Application in outward opening *Figure 1*

Figure 2

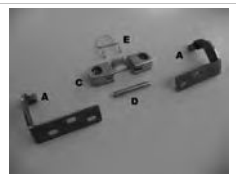


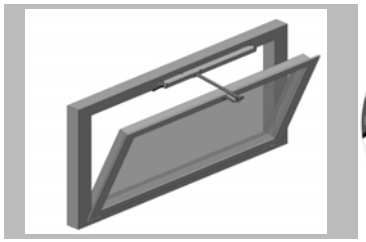
Figure 3

Figure 4

Figure 5

1. Mark the centre line "X" of the frame with a pencil (Fig. 2) or divide it equally if fitting several Syncro[3].
2. Use brackets "A" art. 4010118 and hinge "C" art. 4010116 *(both sold separately.* Fig. 3).
3. Mark the position of the holes to be drilled on the frame as shown in the drawing in #10.4 above. ***Note**: line "**X**" refers to the centre line marked previously (see point 1 above) and line "**Y**" refers to the edge of the sash.*
4. Drill the window frame at the marked points.
5. Fix the brackets (A) to the frame using flat head screws as indicated above. Ensure that the brackets are aligned both horizontally and vertically.
6. Fix the hinge for top hung windows (E) on the sash.
7. Complete the assembly of the chain terminal and the quick hook "E" using pin "D" Ø5x40 (provided) and insert it in a central position (Fig. 4).
8. Hook the actuator onto the brackets by inserting the pins into the two channels at the end of the actuator.
9. Rotate the actuator 90°, bring the chain terminal up to the hinge "C" and insert the pin "D" in the channel. Connect the quick hook to the bracket (Fig. 5). The first time the hook is connected it may be a little tight; this is normal as the parts need to adjust to their sockets.
10. Make the electrical connections as shown in the diagram below or on the label on the power cable.
11. Ensure that the output of the chain is perfectly aligned with the bracket. If necessary, loosen the fixing screws and reposition the bracket properly.
12. Perform a complete opening and closing test on the window. When the closing operation is completed, ensure that the window is properly closed by checking the compression of the seals.
13. The stroke-end of the actuator during return is automatic. The device exerts traction to ensure perfect compression of the seals.

10.6. Assembly with opening inwards – bottom hung, higher part opening towards the interior



Application in inward (vasistas) opening

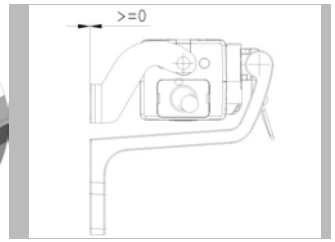


Figure 6

Figure 7

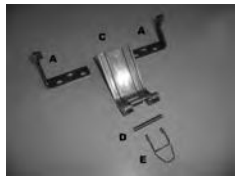


Figure 8

Figure 9

A. Before starting works, at least two flexible mechanical link arms or other form of safety stops MUST be installed to guarantee hold and prevent accidental falling of the window in order to provide safe working conditions.
B. Mark the centre line "X" of the frame with a pencil (Fig. 7) or divide it equally if fitting several Syncro[3].
C. Use brackets "A" art. 4010118 and hinge "C" art. 4010115 (both sold separately. Fig. 8).
D. Mark the position of the holes to be drilled on the frame as shown in the drawing in #10.4 above. ***Note**: line "**X**" refers to the centre line marked previously (see point B above) and line "**Y**" refers to the edge of the sash.*
E. Drill the window frame at the marked points.
F. Fix the brackets (A) to the frame using flat head screws as indicated above. Ensure that the brackets are aligned both horizontally and vertically.
G. Fix the hinge for bottom hung windows (C) on the sash.
H. Complete the assembly of the chain terminal and the quick hook "E" using pin "D" Ø5x40 (provided) and insert it in a central position (Fig. 4).
I. Hook the actuator onto the brackets by inserting the pins into the two channels at the end of the actuator.
J. Rotate the actuator 90°, bring the chain terminal up to the hinge "C" and insert the pin "D" in the channel. Connect the quick hook to the bracket (Fig. 9). The first time the hook is connected it may be a little tight; this is normal as the parts need to adjust to their sockets.
K. Make the electrical connections as shown in the diagram below or on the label on the power cable.
L. Ensure that the output of the chain is perfectly aligned with the bracket. If necessary, loosen the fixing screws and reposition the bracket properly.
M. Perform a complete opening and closing test on the window. When the closing operation is completed, ensure that the window is properly closed by checking the compression of the seals.
N. The stroke-end of the actuator during return is automatic. The device exerts traction to ensure perfect compression of the seals.

11. ELECTRICAL CONNECTIONS

Appliances are equipped with cable manufactured in accordance with safety standards and protection against radio disturbances. **EACH ACTUATOR MODEL MUST USE ITS OWN SPECIFIC CABLE.**

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

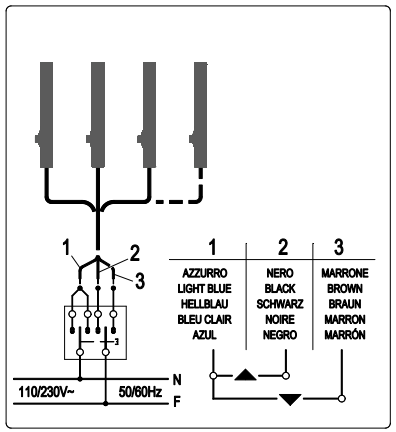
Tension	Cable length	Number of wires	Wire colours	Colour of wires used for notification
100-240V~ 50/60Hz	2 m	3	LIGHT BLUE BLACK BROWN	-
24V⎓	2 m	3	BLACK "1" BLACK "2"	BLACK "3"
100-240V~ 50/60Hz SYNCRO^3	2,5 m	5	LIGHT BLUE BLACK BROWN	WHITE RED
24V⎓ SYNCRO^3	2 m	3	BLACK "1" BLACK "2"	BLACK "3"

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 10 *(Selection of cable section)*.

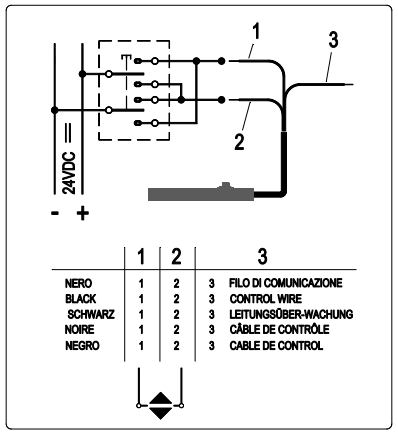
IMPORTANT: in 24V⎓ actuators, wire Black "3" if not used must be insulated and never connected.

11.1. Connections of INKA356.

For cabling, follow the diagrams below.



100-240V~ 50/60Hz



24V⎓

11.2. Connections of INKA356 Syncro³.

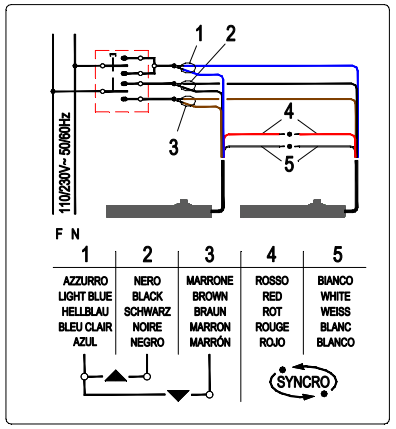
Cable supplied together with the SYNCRO^3 actuator is 2,5m long for 230V~ Syncro³ version and 2 m long for 24V⎓ Syncro³ version; it's calculated in accordance with safety rules.

Electrical connection of the communication wires should be performed using a simple appropriately sized bell clamp *(supplied with the appliance)*. Secure connections with good electrical contact (copper to copper) are vital to avoid communication disturbs.

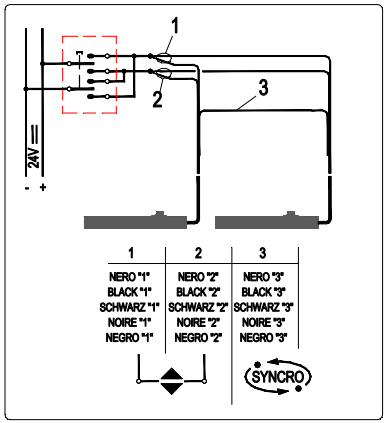
Maximum length of feeding cables can be 10 m.

IMPORTANT: in 24V⎓ actuators, wire Black "3" if not used must be insulated and never connected.

For cabling, follow the diagrams below.



SYNCRO^3 100-240V~ 50/60Hz



SYNCRO^3 24V⎓

12. PROGRAMMING THE ACTUATOR

12.1. INKA 356 Programming

Closing stroke-end

The closing stroke-end 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 complete closure and the seals are completely compressed, i.e., the actuator stops when the power absorbed exceeds a preset threshold. After each closure or intervention of the electronic protection, the chain moves out slightly in order to produce the right compression on the seals and relax the internal mechanical parts.

During operation, the INKA 356 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 12.3), occurs the first time the actuator closes the window completely following a RESET operation and remains stored as an operating parameter.

Opening stroke-end

The INKA 356 actuator is supplied with the RESET procedure already executed and a preset maximum stroke.

The overlap still needs to be "acquired" (paragraph 12.3), and a smaller stroke selected if necessary.

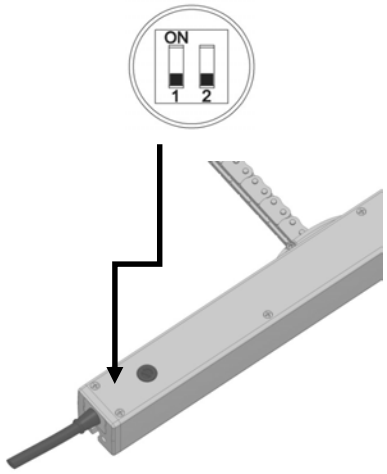
IMPORTANT: If the K-LOCK electro-lock is fitted, a new RESET procedure must be performed.

When using the INKA 356 Syncro³ model, the RESET procedure and acquisition of the overlap must be performed during installation (see paragraphs 12.2 and 12.3) before the desired opening stroke-end can be selected. We recommend checking the electrical wiring before starting the RESET procedure.

If the settings are lost, a new RESET procedure must be performed followed by acquisition of the overlap (see paragraphs 12.2 and 12.3).

Three positions can be selected for the stroke-end positions of the outgoing chain by setting dip switches no. **1** and **2** (see table below). Programming is quick and simple and can be done at any time.

ACTUATOR	*DIP 1*	*DIP 2*	*FUNCTION*
INKA 356 – Max. Stroke 300	OFF	OFF	RESET
	ON	OFF	STROKE 100
	OFF	ON	STROKE 200
	ON	ON	STROKE 300
INKA 356 – Max. Stroke 600	OFF	OFF	RESET
	ON	OFF	STROKE 400
	OFF	ON	STROKE 500
	ON	ON	STROKE 600
INKA 356 – Max. Stroke 800	OFF	OFF	RESET
	ON	OFF	STROKE 600
	OFF	ON	STROKE 700
	ON	ON	STROKE 800
INKA 356 – Max. Stroke 1000	OFF	OFF	RESET
	ON	OFF	STROKE 800
	OFF	ON	STROKE 900
	ON	ON	STROKE 1000



After setting the stroke-end, it is recommended that you perform some test manoeuvres. In case of error, the setting can be repeated in order to obtain the desired stroke. If you need to execute the RESET procedure, see the instructions below.

12.2. RESET Procedure - Valid for the single-actuator configuration, Syncro³ configuration or configurations with the K-LOCK electro-lock

This procedure should be carried out with the chain terminal (or terminals, for configurations with several devices) uncoupled from the window sash bracket.

IMPORTANT: The dip-switch settings should be changed to non-powered actuators; after each change it is necessary to wait a few seconds (~ 5 sec) before restoring the power to the actuators in order for the change to become effective.

- Set the dip-switches in the following manner: **DIP 1 OFF** – **DIP 2 OFF**. For configurations with several devices (or with the K-LOCK electro-lock), the setting of the dip-switches as described above should only be changed for one actuator, and the other devices will link to it automatically.
- Supply power to the actuators (either by opening or closing). The initializing phase will then start.
- The actuator will start at once (or after about 8 seconds if there is an electro-lock) and perform a full closing manoeuvre (chain completely retracted) and then an opening manoeuvre of about 5 cm. During this phase, ensure that there are no obstacles to the movement of the chain and wait until the closing manoeuvre is completed on all actuators.
- When the operation is finished, each connected device gives a flashing orange signal to indicate completion of the RESET procedure. Each device will give a different number of flashes to indicate that the access code is received (actuator 1 → 1 flash → pause → 1 flash → pause; actuator 2 → 2 flashes → pause → 2 flashes → pause, etc.).
- The power supply to the devices can now be switched off and the dip-switches used to set the desired stroke on all the actuators (as shown in the table on page 17).
- Couple the chain terminal to the movable sash bracket.

Once the RESET procedure is executed, at the next complete closure the actuator will repeat the overlap acquisition operation.

If the K-LOCK electro-lock is present, refer to the respective user and installation manual.

12.3. Overlap acquisition

The operation that must be carried out to acquire the overlap (after the RESET procedure has already been executed) is described below:

- Assembly of the actuator(s) on the window (as per chapter 10).
- Electrical connection of the actuator (as per chapter 11).
- Coupling of the chain terminal(s) to the sash bracket (as per chapter 10).
- Execute the window closing command.
- Wait until the window is completely closed. An orange light will flash on the actuator for 3 seconds to indicate that the overlap has been successfully acquired.

IMPORTANT: If, for any reason, the actuator fails to complete the closure of the window correctly, stopping before finishing the stroke, the RESET and overlap acquisition operation will have to be repeated in that order, until the procedure is completed correctly.

When the window is closed, check that the chain terminal protrudes completely from the actuator body by at least a couple millimeters; this ensures that the window is closed well and the seal is compressed properly, otherwise the window may not be completely closed.

Check also that the attachments and support brackets are solidly joined to the window and the screws are tightened properly.

It is recommended that you avoid using self-threading or self-drilling screws on aluminum windows, since they can tear the profile after a few manoeuvres; use metric screws with threaded inserts instead *(see instructions in paragraph 10.2)*.

12.4. LED Light signals

If there are any problems during installation or operation of the machines, consult the possible causes listed below:

WITH RED LED		
Number of Flashes	***Type of Error***	***Possible Solution***
1	***Current error:*** *The actuator has detected an overcurrent in the motor.*	Check that there are no obstacles preventing the actuator from completing its stroke. Check that the actuator is installed correctly.
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	***Contrasting Dip-switch settings:*** *The devices connected to one another 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 outside 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 Syncro configuration exceeds the maximum amount allowed.*	Repeat the RESET procedure.
10	***Memory error:*** *The internal memory write process 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.

WITH GREEN LED	
LED Status	***Meaning***
STEADY-ON	*Device powered correctly.* *The device executed a chain re-entry stroke correctly, completing the operation by writing to the memory.*
FLASHING	*Device powered correctly. The device 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	
LED Status	***Meaning***
STEADY-ON **Duration < 0.5 sec.**	*Internal memory write 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 number assigned to the device in a configuration with several devices.*

13. CHECKING FOR CORRECT ASSEMBLY

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

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

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

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

14. EMERGENCY MANOEUVRES, MAINTENANCE OR CLEANING

In the event that the window frame should require manual opening due to power failure or problem with the mechanism or for normal maintenance or external cleaning of the window frame, the NEKOS patent allows rapid unhooking of the chain. To perform this operation, proceed as follows:

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

3. Manually open the window frame.

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

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

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 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. TEST REPORT RWA (EMC)

Evidence of Performance

Performance of natural smoke and heat exhaust ventilators
Heat resistance test

Test Report
No. 16-002023-PR03
(PB-A04-01-en-01)

ift ROSENHEIM

Client	NEKOS srl Via Capitoni, 7/5 36064 Mason Vicentino VI Italy
System partner	-
Product	Natural smoke and heat exhaust ventilators
Designation	"SHEV WALL AWS 70 HI"
Overall dimensions of unit (W x H)	2,400 mm x 1,250 mm
Clear opening (W x H)	2,260 mm x 1,110 mm
Frame material	"Aluminium profiles with thermal barrier, Schüco AWS 70 HI"
Design	"Single bottom hung window, inward opening"
Type of installation	90° wall installation
Drive	"Chain drive INKA 356 24V"
Special features	-

Natural smoke and heat exhaust ventilators NSHEV

Heat resistance test

Classification
as per DIN EN 12101-2:2003-09 Annex G

B 300

ift Rosenheim
27.06.2016

ift Rosenheim – Notifizierte Prüf-, Überwachungs- und Zertifizierungsstelle – PÜZ – EG-Referenz-Nr. 0757

Dr. Gerhard Wackerbauer, Dipl. Phys.
Head of Testing Department
Fire safety

Anyke Aguirre Cano, Dipl.-Ing. (FH)
Operating Testing Officer
Fire safety

Basis
EN 12101-2:2003
EN 1363-1:2012

Equivalent to the national versions DIN EN.
Test report 15-002362-PR03 (PB-A04-01-de-01) dated 09.03.2016

Representation

Instructions for use
This test report serves to demonstrate the performance of natural heat and smoke exhaust ventilators (NSHEVs) when exposed to heat.
This test report does not provide any evidence of specified use/verification of applicability as set out by the relevant Building Control Authorities!

Validity
The data and results given relate solely to the tested and described specimen.

Notes on publication
The ift-Guidance Sheet "Conditions and Guidance for the Use of ift Test Documents" applies.
The cover sheet can be used as an abstract.

Contents
The report contains a total of 22 pages (incl. annexes)

1 Object
2 Procedure
3 Results
Annex (16 pages)

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Inspektion – EN ISO/IEC 17020
Zertifizierung Produkte – EN ISO/IEC 17065
Zertifizierung Managementsysteme – EN ISO/IEC 17021

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.** Via Capitoni 7/5- 36064 Mason Vicentino (Vicenza) - 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 :*	**24 V KATO 305 RWA - KATO 305 SYNCRO^3** **INKA 356 RWA - INKA 356 SYNCRO^3 RWA**

Anno di costruzione dal / *Year of manufacturing from:* **2017**

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: **ing. Matteo Stefani – 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)*

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; EN 61000-6-2:2005 + AC:2005
EN 60335-1:2012 + EN 60335-1/A11:2014; EN 50581:2012; EN 12101 - 2

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 Mason Vicentino (Vicenza) - Italy

Rappresentato da / Represented by :
Giuliano Galliazzo – A.D. Presidente / President CEO

Luogo e data / *Place and date*: Mason Vicentino **28/07/2017** *Firma / Valid signature*

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