

MINGARDI[®]
THE REFERENCE FOR WINDOW AUTOMATION

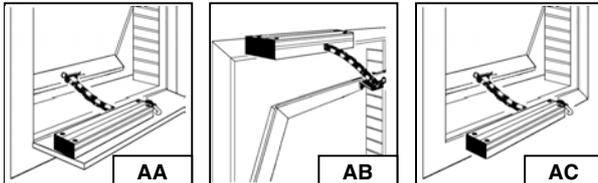
SOLUZIONI PER L'AUTOMAZIONE DEI SERRAMENTI
SOLUTIONS FOR AUTOMATIC WINDOW OPENING
SOLUTIONS POUR L'AUTOMATION DES MENUISERIES
LÖSUNGEN FÜR DIE AUTOMATION FENSTERN
OPLOSSINGEN VOOR AUTOMATISCH SLUITEN EN OPENEN
SOLUCIONES PARA LA AUTOMACIÓN DE LOS CERRAMIENTOS
SOLUÇÃO PARA A AUTOMATIZAÇÃO DOS FECHOS DE JANELAS
Λύση για τον αυτοματισμό των κλειδαριών
AUTOMATISERINGSLÖSNINGER TIL VINDUER
RATKAISUT IKKUNOIDEN AUTOMAATTISOINNILLE
AUTOMATISERINGSLÖSNINGER FOR VINDUER
AUTOMATISERINGSLÖSNINGAR FOR FÖNSTER

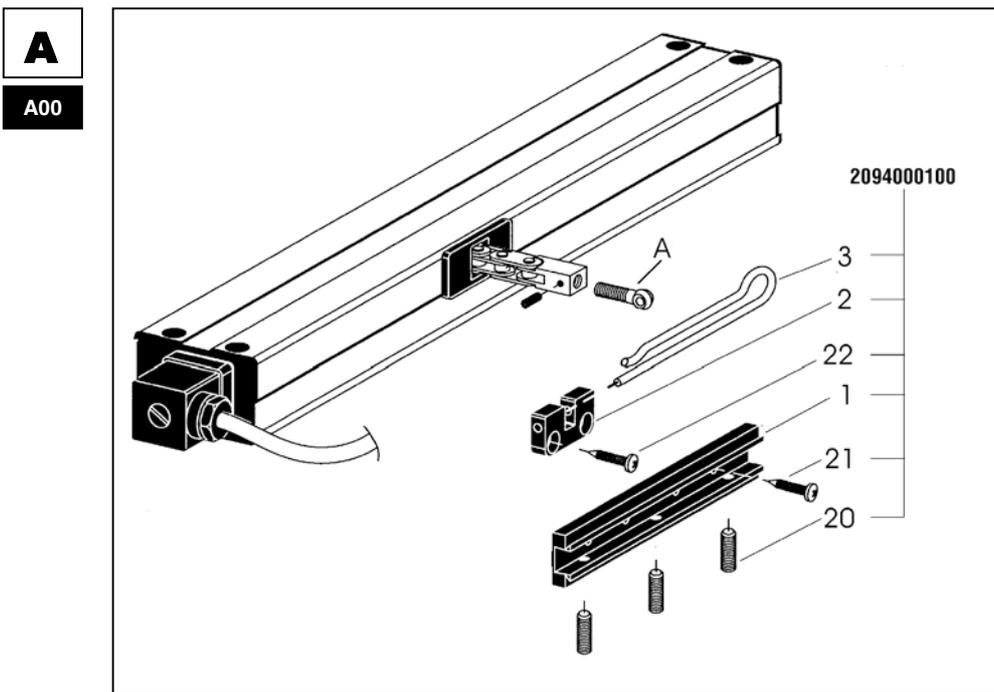
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Micro L 230V ~
Micro L 24V ---

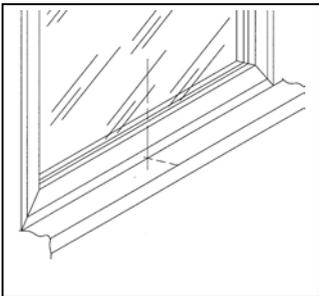


•APPLICAZIONI • APPLICATIONS • APPLICATIONS • ANWENDUNGSMÖGLICHKEITEN • TOEPASSINGEN • APLICACIONES
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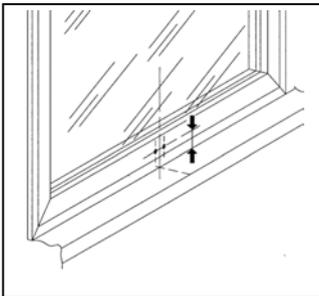




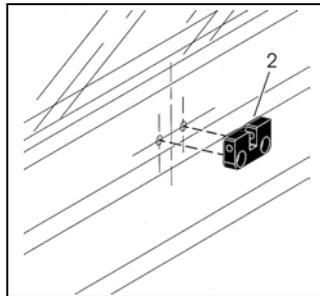
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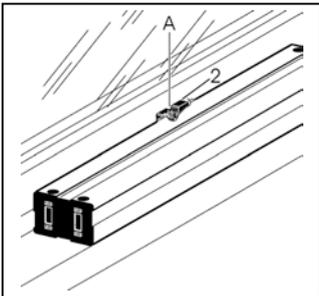
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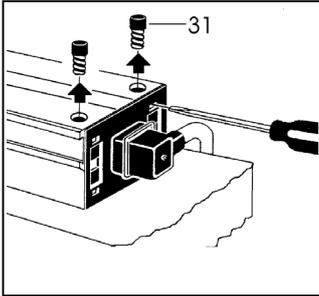
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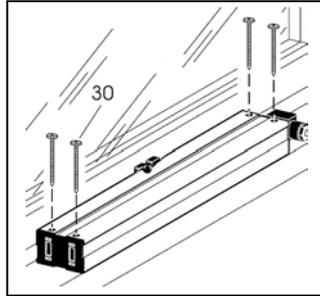
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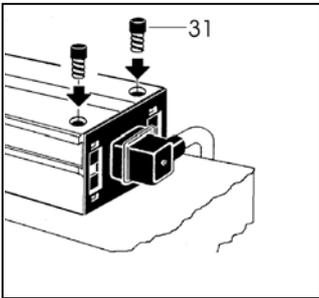
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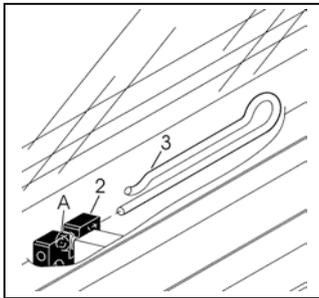
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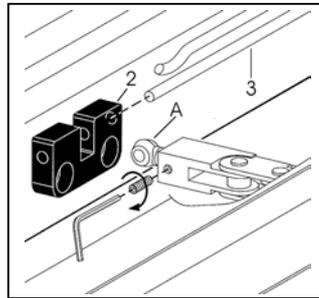
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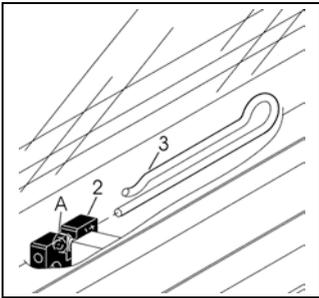
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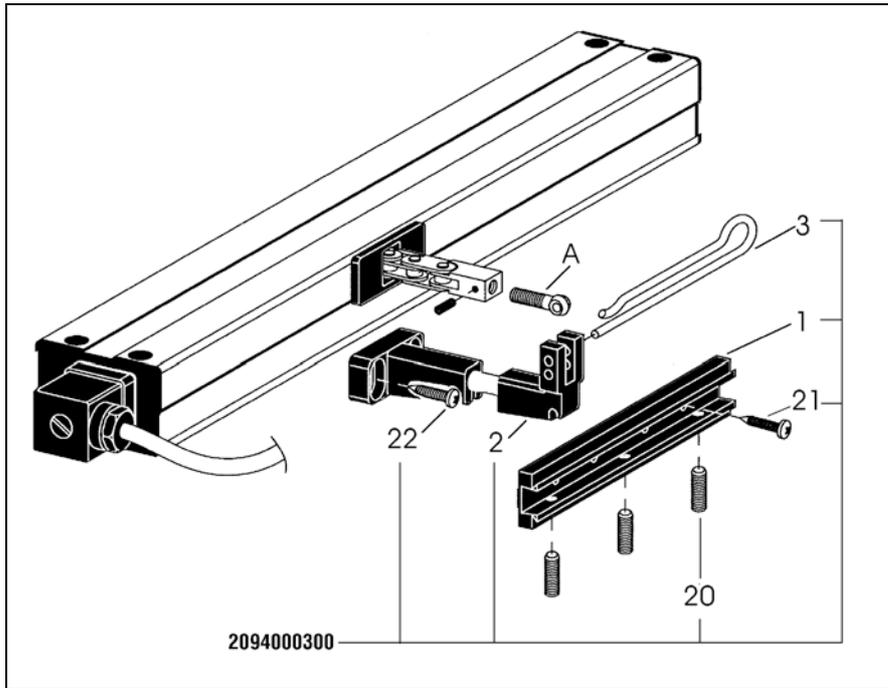


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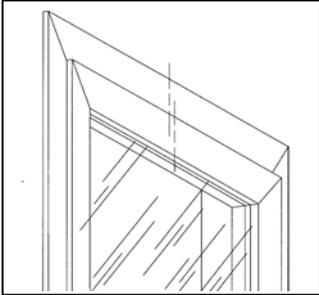


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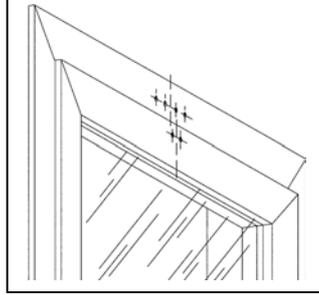
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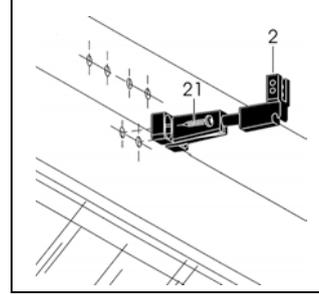
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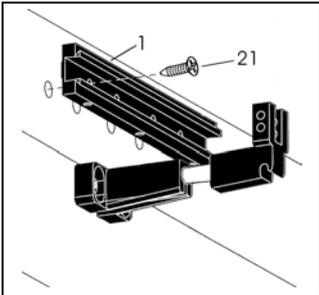
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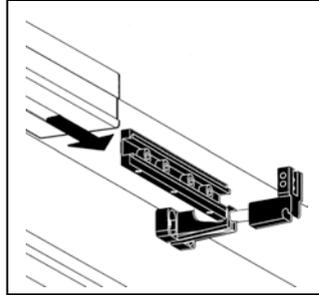
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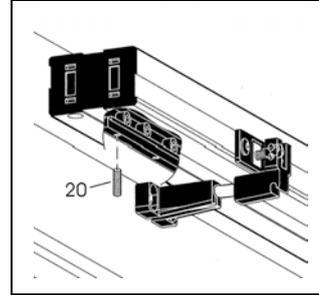
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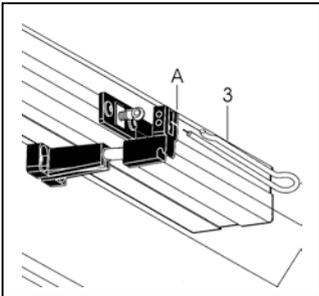
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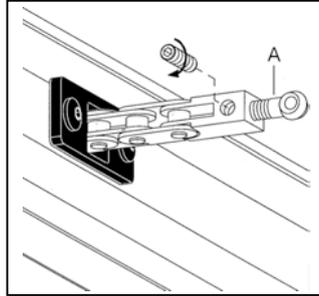
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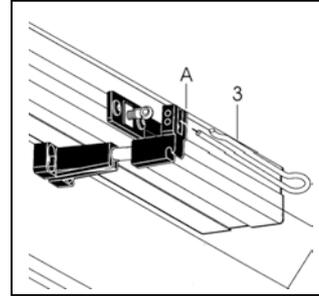
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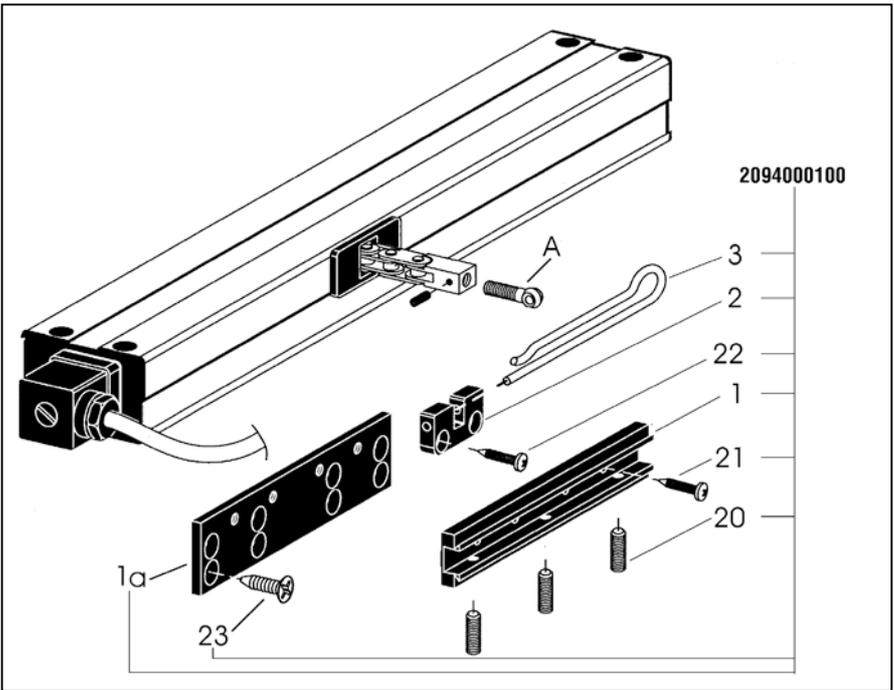
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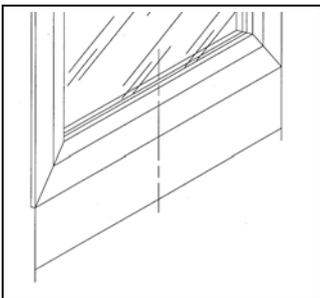
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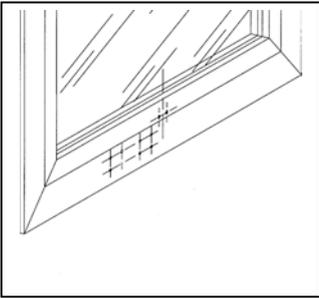
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C00



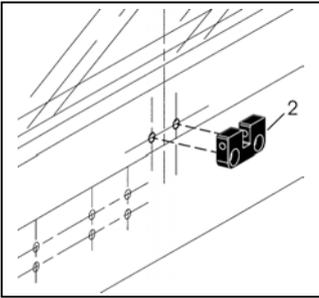
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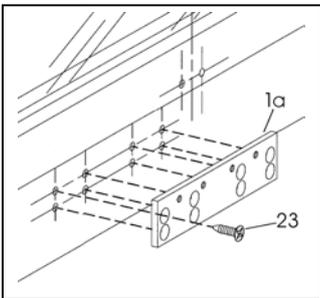
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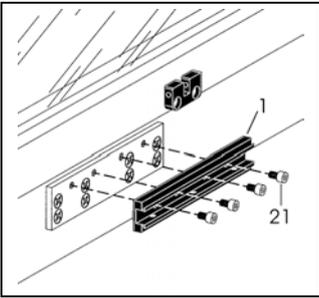
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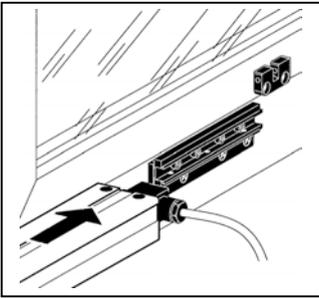
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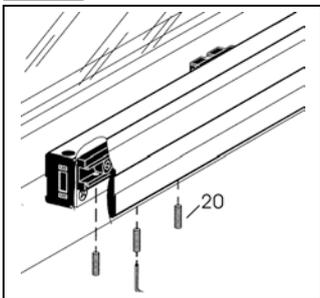
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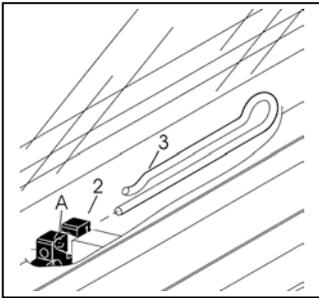
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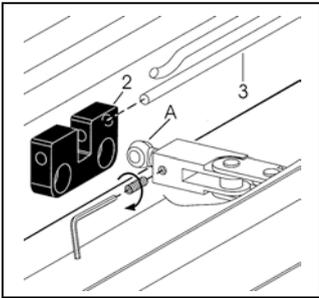
C07



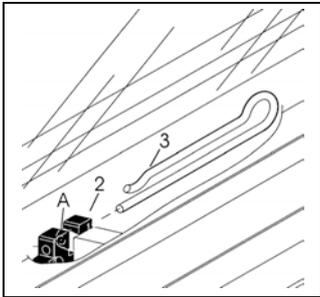
C08



C09



C10





Before embarking on any installation or wiring operations, read this manual extremely carefully.

The user must refer to the notes contained in it and keep it safely for future reference.

EXPLANATION OF THE SYMBOLS



Read this manual carefully.



Danger!
Danger of electric shock.



Danger!
Danger that could cause personal injury.



Danger!
Danger of hands being crushed.



Warning!
Draws attention to instructions that must be followed in order to prevent damage to the actuator.



Notice
Indicates important notices to which great attention must be paid.

NOTES ON THE ACTUATOR



The MICRO L actuator complies with the current safety standards. Operating safety can be guaranteed only if installers comply with the safety regulations in force in the country where the actuator is used.

The MICRO L actuator is designed exclusively to open and close top hung windows and hopper-frame windows and is designed only for indoor use. Any other application of the actuator must be approved by Mingardi S.r.l. after technical testing of the application.

Use only original accessories or accessories approved by Mingardi S.r.l. to install the actuator.

IMPORTANT SAFETY REGULATIONS



Warning!
In order to ensure personal safety, strictly comply with the regulations that are set out below.

USE AND MAINTENANCE

When using the MICRO L actuator, follow these safety regulations:



Do not allow children to play with the remote controls;
Observe the moving parts closely and allow neither adults nor children to approach until the moving parts have come to a complete stop;



At least once a year, check that the power cable has not been damaged and that it shows no sign of wear;



Check that no object obstructs the window movement;
If faults arise, never work on the actuator and never open or dismantle parts of the actuator that deny access to the inside of the mechanism.

If the actuator fails to function or is damaged, contact service engineers; do not use the actuator until it has been repaired.

INSTALLATION

Only qualified installers can carry out installation.

The MICRO L actuator must be assembled and wired up only by specialised staff who have been properly trained and who are familiar with the problems connected with automatic window opening and closing systems, technical reference standards and safety standards.



Warning!
Incorrect installation may make the actuator dangerous! Follow all the instructions set out below.



Checks

Before installing, check that:

- The actuator performance is sufficient to open and close the window (ensure that the limits indicated on the actuator ratings plate are not exceeded). Remember that the window, especially if it is a skylight, may have to not only stand up to the wind but also bear the weight of snow and perhaps of ice.
- The minimum height of the window is more than 900 mm (top hung windows and hopper-frame windows).
- The frame components and hinges are of an adequate size to stand up to the operating stress.
- The hinges and fixtures enable the actuator to complete its opening stroke in order to prevent damages to structures due to the thrust and tensile stress exerted by the actuator.
- The electrical control systems comply with the regulations in force in the country of use.
- The actuator's power cables are sufficiently wide in diameter.
- The mains power supply and main switch are near the window.
- There is a junction box to house the power cable conductors.
- The packing contains all the component parts and accessories required to install the actuator (A00 - B00 – C00).
- The actuator operates smoothly and correctly when it is powered up and the two limit switches are triggered in order to limit the maximum and minimum stroke of the chain.
- That during assembly and disassembly of the actuator from the window, as it is not fixed in the open or closed position, appropriate measures are taken to avoid any accidental banging with hits, breakages or the window and injury to the operator.
- A platform or scaffolding is provided if the actuators are to be installed at a height of more than 2.5 metres.



**FITTING TO TOP HUNG WINDOWS
WITH SILL**

A01

- Find and mark the centre line of the window and of the fixed frame.

A02

- Drill a hole on the centre line for the front attachment (2) at a height corresponding to the actuator support surface. The holes for fitting the front attachment can be drilled at 20.5 mm from the surface on which the actuator will be fixed, depending on the space available.

A03

- Use the screws supplied to fix the bracket (2) to the frame (if in aluminium).

A04

- Fit the actuator onto the window sill and align the front head "A" on the housing for the frame fitting (2).

A05

- Insert a screwdriver into the slits on the cover and remove the plastic protective plugs. Take care to remove only the protective plugs (31) on the side where the screws are inserted, opposite to the actuator support surface.



Warning!

The plugs underneath must be left in their housing to prevent the covers from being moved.

A06

- If the material of the sill enables it, fix the actuator to the sill by inserting the screws (30) and tightening them. The screws will perforate the plastic plugs that have been left in their housing. Otherwise, drill using the four holes on the actuator as a drilling template, insert the screws (not supplied) and tighten.

A07

- Close the screw holes by inserting the plugs (31) on the side where the screws are inserted.



A08

- Align the adjustable head "A" on the frame fitting (2).
- Close the window by exerting a certain amount of pressure and adjust the head "A" by tightening or loosening it until the holes are aligned and then insert the safety cotter pin (3).

A09

- Connect the actuator to the mains supply as shown in the enclosed wiring diagrams and in compliance with safety standards.
- Run the actuator to the end of stroke to open the window and close it again. This operation tests that the actuator is working correctly and that the window is closing properly.



Danger!

Danger of hands being crushed. When the window is moving, do not insert your hand between the fixed frame and the window pane.

- If the window does not close satisfactorily, make the following adjustments:
 - 1) Disconnect the actuator.
 - 2) Remove the safety cotter pin (3).
 - 3) Screw head "A" by a few turns.
 - 4) Keep the window taut to align the head holes and the front fitting (2).
 - 5) Insert the safety cotter pin (3).
- To ensure maximum chain stability during the opening phase, switch on and run the actuator until approximately 5 cm of the chain emerges. Tighten the hexagonal-head dowel on the side of head "A" with the Allen wrench supplied.

A10

Checking the operating efficiency of the limit switches of the MICRO L actuator

- The MICRO L actuator is fitted with two limit switches that stop opening and closing at the beginning and the end of the stroke. It is therefore necessary to ensure that the internal microswitches disconnect the power supply to the motor when the fully opened and fully closed positions are reached. When the fully opened or fully closed positions are reached, you will feel the motor making the outer structure vibrate if you lay your hand on it.

- If the motor does not cut out when the end of the stroke is reached, follow this procedure to adjust:
 - 1) Disconnect the actuator from the power supply.
 - 2) Remove the safety cotter pin (3).
 - 3) Unscrew head "A" by a few turns (0.8 mm per turn).
 - 4) Keep the window taut to align the head holes and the front fitting (2).
 - 5) Insert the safety cotter pin (3).

B FITTING TO A HOPPER-FRAME WINDOW



Warning!

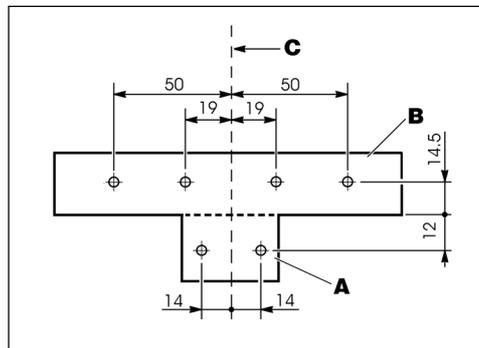
Always fit safety stay brackets (not supplied).

B01

- Find and mark the centre line C of the window and the fixed frame.

B02

- Drill holes in the places indicated on the drawing, using drill bits of the required diameter, as per the following scheme:



| Window | Screws | Drill bits (diameter in mm) |
|--------------------------------------|------------------------|-----------------------------|
| A – Mobile frame | AF 4.8 X 22 UNI6954 | 3,7 |
| B – Fixed frame | AF 4.2 X 13 UNI6954 | 2,7 |
| C – Centre line of the window | | |



INSTRUCTIONS ON FITTING, USING AND MAINTAINING THE ACTUATOR

Micro L

B03

- Screw the bracket (2) to the window using the screws supplied (only for aluminium windows).

B04

- Screw the bracket (1) to the fixed frame using the screws supplied (only for aluminium windows).

B05

- Fit the actuator to the bracket (1) and run it along the guide until adjustable head "A" is centred on the housing for the frame fitting (2).

B06

- Fix the actuator in this position by using the Allen wrench supplied to tighten the hexagonal-head dowels (20) on the back of the bracket.

B07

- Align the adjustable head (A) on the frame fitting.
- Close the window by exerting a certain amount of pressure and adjust the head "A" by tightening or loosening it until the holes are aligned and then insert the safety cotter pin (3).

B08

- Connect the actuator to the mains supply as shown in the enclosed wiring diagrams and in compliance with safety standards.
- Run the actuator until it is fully extended to open the window and close it again. This operation checks the correct working of the actuator, limit switches and that the window is closing properly.



Danger!

Danger of hands being crushed. When the window is moving, do not insert your hand between the fixed frame and the window pane.

- If the window does not close satisfactorily:
 - 1) Disconnect the actuator.
 - 2) Remove the safety cotter pin (3).
 - 3) Screw head "A" by a few turns.
 - 4) Keep the window taut to align the head holes and the front fitting (2).
 - 5) Insert the safety cotter pin (3).

- To ensure maximum chain stability during the opening phase, switch on and run the actuator until approximately 5 cm of the chain emerges. Tighten the hexagonal-head dowel on the side of head "A" with the Allen wrench supplied.



Warning!

Window closing can be further adjusted by lengthening or shortening the telescopic bracket (2).

B09

Checking the operating efficiency of the MICRO L actuator

- The MICRO L actuator is fitted with two limit switches that stop opening and closing at the beginning and the end of the stroke. It is therefore necessary to ensure that the internal microswitches disconnect the power supply to the motor when the fully opened and fully closed positions are reached. When the fully opened or fully closed positions are reached, you will feel the motor making the outer structure vibrate if you lay your hand on it. If the motor does not cut out when the end of stroke is reached, follow this procedure to adjust:
 - 1) Disconnect the actuator.
 - 2) Remove the safety cotter pin (3).
 - 3) Unscrew head "A" by a few turns (0.8 mm).
 - 4) Keep the window taut to align the head holes and the front fitting (2).
 - 5) Insert the safety cotter pin (3).



C

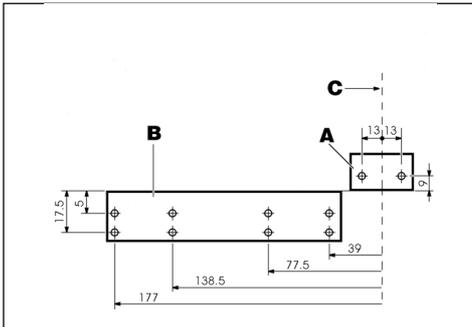
FITTING TO TOP HUNG WINDOWS

C01

- Find and mark the centre line of the window and the fixed frame.

C02

- Drill holes in the places indicated on the drawing, using drill bits of the required diameter, as per the following scheme:



| Window | Screws | Drill bits (diameter in mm) |
|--------------------------------------|-------------------------|-----------------------------|
| A – Mobile frame | AF 4.8 X 13 UNI6954 | 3.7 |
| B – Fixed frame | AF 4.2 X 9.5 UNI6955 | 3.2 |
| C – Centre line of the window | | |

C03

- Fit the bracket (2) to the window using the screws supplied (only for aluminium windows).

C04

- Fix the spacer (1a) for the bracket (1) using the screws supplied (only for aluminium windows).

C05

- Fix the bracket (1) onto the spacer using the screws supplied.

C06

- Fit the actuator to the bracket (1) and run it along the guide until adjustable head “A” is centred on the housing for the frame fitting (2).

C07

- Fix the actuator in this position by using the Allen wrench supplied to tighten the hexagonal-head dowels (30) on the back of the bracket.

C08

- Align the adjustable head (A) on the frame fitting.
- Close the window by exerting a certain amount of pressure and adjust the head “A” by tightening or loosening it until the holes are aligned and then insert the safety cotter pin (3).

C09

- Connect the actuator to the mains supply as shown in the enclosed wiring diagrams and in compliance with safety standards.
- Run the actuator until it is fully extended to open the window and close it again. This operation checks the correct working of the actuator and of the limit switches, and that the window is closing properly.



Danger!

Danger of hands being crushed. When the window is moving, do not insert your hand between the fixed frame and the window pane.

- If the window does not close satisfactorily, make the following adjustments:
 - 1) Disconnect the actuator
 - 2) Remove the safety cotter pin (3).
 - 3) Screw head “A” by a few turns.
 - 4) Keep the window taut to align the head holes and the front fitting (2).
 - 5) Insert the safety cotter pin (3).
- To ensure maximum chain stability during the opening phase, switch on and run the actuator until approximately 5 cm of the chain emerges. Tighten the hexagonal-head dowel on the side of head “A” with the Allen wrench supplied.



C10

Checking the operating efficiency of the limit switches of the MICRO L actuator

- The MICRO L actuator is fitted with two limit switches that stop opening and closing at the beginning and the end of the stroke. It is therefore necessary to ensure that the internal microswitches disconnect the power supply to the motor when the fully opened and fully closed positions are reached.

When the fully opened or fully closed positions are reached, you will feel the motor making the outer structure vibrate if you lay your hand on it. If the motor does not cut out when the end of stroke is reached, follow this procedure to adjust:

- 1) Disconnect the actuator.
- 2) Remove the safety cotter pin (3).
- 3) Unscrew head "A" by a few turns (0.8 mm per turn).
- 4) Keep the window taut to align the head holes and the front fitting (2).
- 5) Insert the safety cotter pin (3).



Danger!

Danger of hands being crushed. When the window is moving, do not insert your hand between the fixed frame and the window pane.



Warning!

If safety devices prevent the window from being fully opened, or if the window is opened less than the full stroke of the actuator, the actuator or the window may be damaged.



Warning!

Install two normally open interlocking switches that use a 'dead-man' or similar command.

Connect to the main power supply by means of a 4 conductor cable (4x1 mm²) that is sufficiently long to reach the junction box, which must be situated near the actuator.

Remote controls should be installed in such a position that the automatic opening and closing system can be seen. It should be positioned at a height of at least 1.5 m.

If the actuator has been designed to function without supervision (automatic operation or remote control), additional safety devices should be fitted.



**CONNECTING TO THE POWER
SUPPLY**

These wiring instructions are directed exclusively at specialised persons who are qualified to install electrical systems. Such persons must at all times comply with current regulations governing electrical installations.



Danger!

In order to eliminate the danger of electric shock, disconnect the controls from the power supply before working on the actuators or the electrical system. Always fit a main power switch upstream of the control line cable with a gap of at least 3 mm between contacts.



Danger!

If the actuator to be installed is in the 24V DC version, it must be connected to the mains with a double insulation power supply with very low safety voltage that is properly sized for its use. Also the following power supply and system characteristics must be observed:

Supply voltage: 24 V +/- 10%

Ripple max: +/- 10%

Max supply line capacity: 250 nF

Max supply line inductance: 10 mH



D01

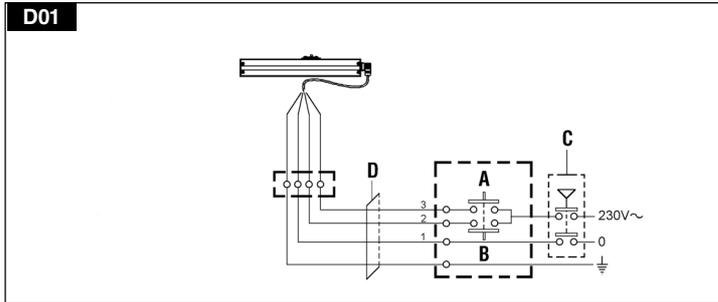
Single connection.

D02

Connection of more than
one actuator.

- 1 – Blue
- 2 – Black
- 3 – Brown
- Yellow / Green

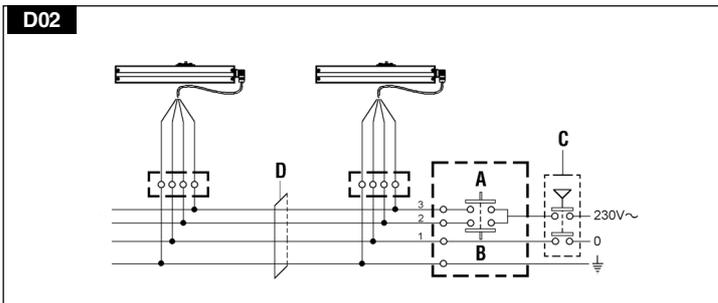
D01



D02

A - Closes
B - Opens
**C - Main switch minimum
contact opening: 3 mm**

**D - 4 wires, section
1 mm²**



D03

Single connection.

D04

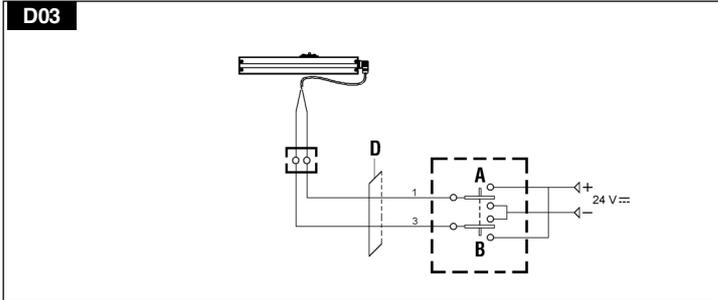
Connection of more than
one actuator.

- 1 – Blue
- 3 – Brown

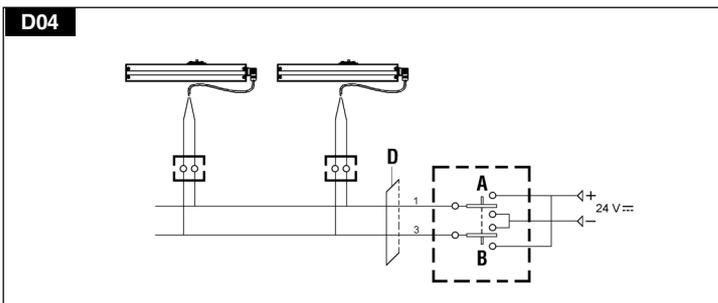
A - Opens
B - Closes

**D - 2 wires, section
1 mm²**

D03



D04





SPECIFICATIONS

Micro L

Applications

Electric remote controlled opening and closing of top hung windows and hopper-frame windows on public, private and industrial premises.

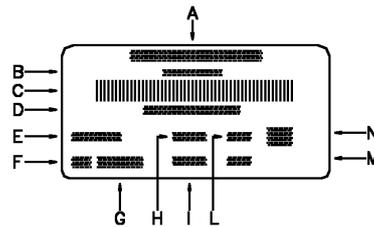
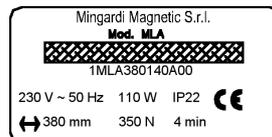
Appliance features

- Limit switch that is automatically triggered when the final position (window open or closed) is reached.
- Opening stroke: can be varied between 280 and 380 mm.
- Closing fine adjustment.

Possible actuator controls

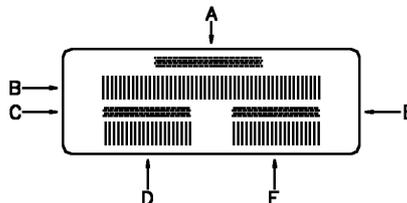
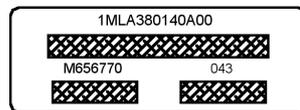
- Manual switch.
- A snow or rain detection device.

Actuator ratings plate



DATA PLATE (placed on the product)

- A MANUFACTURER'S NAME
- B PRODUCT MODEL
- C PRODUCT BAR CODE
- D PRODUCT CODE NO.*
- E WORKING VOLTAGE AND FREQUENCY
- F PRODUCT STROKE SYMBOL
- G PRODUCT STROKE MAGNITUDE
- H PRODUCT POWER
- I PRODUCT THRUST/TENSILE FORCE
- L PRODUCT DEGREE OF TIGHTNESS
- M CONTINUOUS TIME OF OPERATION
- N CE APPROVAL MARK



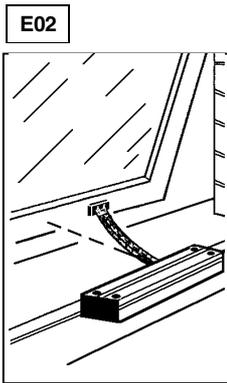
EL.INS. PLATE (placed on the product)

- A PRODUCT CODE NO.
- B PRODUCT BAR CODE
- C WORK ORDER CODE NO.* / MINGARDI PRODUCTION LOT
- D WORK ORDER BAR CODE / MINGARDI PRODUCTION LOT
- E MINGARDI TEST REPORT NO.*
- F MINGARDI TEST REPORT BAR CODE NO.*

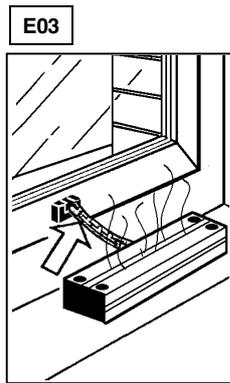
| 1MLA | 280 | 1 | 4 | 0 | N | 00 |
|--------|------------------------|------------------------|---------------------|--------------------|---|-------------------------|
| Family | Max. stroke | Power supply voltage | No. Wires per cable | Type of connection | Colour | Varianti personalizzate |
| | 280=280mm 380=380mm | 1=230V~50Hz 9=24VDC | 2/4 | 0=No connection | N = Anodised black A = Anodised silver B = White RAL 9016 | 00=No variants |



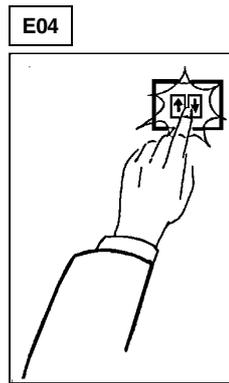
ERRORS TO BE AVOIDED



Assembly not aligned with actuator



Stroke has not been adjusted or has been incorrectly adjusted



Double control switch is not interlocked