User Manual

Power-operated sliding windows SI-1000

Power-operated sliding windows

User manual for power-operated Sky-Frame sliding windows.

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General information

1. General information
1.1 Information concerning this manual

This manual describes how to use the system safely and efficiently. The manual is a constituent of the system and must be accessible and in close proximity to the system at all times.

Always read manual carefully before starting work. A basic prerequisite for safe working is adhering to all safety instructions and action instructions in this manual.

The illustrations in this manual are intended to provide a basic understanding and may differ from the actual situation.

1.2 Explanation of symbols

Safety instructions:

The safety instructions in this manual are marked with symbols. The safety instructions are preceded by signal words that indicate the level of danger.
Adhering to the safety instructions and taking careful action will help to avoid accidents, injuries and damage to property.

WARNING! (Danger to life and limb)

This combination of symbol and signal word indicates a potentially dangerous situation that could lead to death or serious injury if it is not avoided.

CAUTION! (Risk of fault)

This combination of symbol and signal word indicates a potentially dangerous situation that could lead to minor injuries if it is not avoided.

NOTE:

This symbol highlights useful tips, recommendations and information for efficient and fault-free operation.

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Special safety instructions

In order to point out particularly dangerous situations, the following symbols are used in safety instructions:

DANGER! (electric shock)

This combination of symbol and signal word marks dangers caused by electrical current. Failure to observe the safety instructions will result in a risk of serious of fatal injury.

Symbols in this manual

The following symbols and highlighting are used in this manual to mark action instructions, result descriptions, lists, references and other elements:

1. Marks step-by-step action instructions.

-> Marks a status or an automatic sequence resulting from an action step.

- Marks lists and list entries with no fixed order.

[-> Page No.] References to chapters in this manual.

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1.3 Liability restriction

All information and notes in this manual have been put together taking the applicable standards and regulations, the state of technology, our knowledge and our many years of experience into consideration.

The manufacturer does not accept liability for damage caused by:

- Failure to follow the instructions in the manual
- Failure to use the equipment for its correct purpose
- Making technical modifications
- Using non-approved spare parts

The actual scope of delivery may differ from the information in this manual in the event of customised versions, the use of additional ordering options or because of technical changes.

The obligations agreed in the delivery agreement, the manufacturer his general business terms and conditions and delivery conditions, and the legal regulations that were applicable when the agreement was signed are applicable.

1.4 Copyright

1.5 Warranty conditions

The warranty conditions are included in the manufacturers his general business terms and conditions.

1.6 Customer service

If you have questions about your Sky-Frame product please contact your official Sky-Frame partner (see last page).

Our employees are also always interested in receiving new information and experiences resulting from the use of the equipment that may be useful for improving our products.

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Power-operated sliding windows SI-1000 Safety

2. Safety

This section provides an overview of all important safety aspects for providing the user with the best possible protection and for ensuring that operation is safe and problem-free.

Failure to observe the action instructions and safety instructions in this manual can lead to considerable danger.

2.1 Use for correct purpose

The equipment is exclusively designed and constructed for the intended purpose of use that is described in this document.

The equipment is exclusively intended for installation in a wall opening, and is intended to provide light, ventilation and access.

Correct purpose of use also includes complying with all of the specifications in this manual.

Any other use is considered to be incorrect.

WARNING!
Danger from incorrect use!

Using the equipment incorrectly can lead to dangerous situations.

- The sliding panels must never be bent, twisted or subjected to additional loads.
- Do not place objects in the door area between the sliding panels and the frame.
- Never slacken screws or remove them from the system.

Claims of any kind for damage caused by incorrect use will not be entertained.

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Power-operated sliding windows SI-1000 Safety

2.2 Basic dangers

In order to minimise health hazards and avoid dangerous situations, the safety instructions listed here and in the other chapters of this manual must be followed.

Electric current

DANGER!
Risk of fatality due to electric current!

Coming into contact with live components will result in a direct risk of fatality due to electrocution. Damage to the insulation of individual components can be life-threatening.

- Never undo screws on the system and remove the service cover.
- Have all work on the electrical system carried out by professional electricians.
- In the event of damage to the insulation, switch off immediately and have it repaired.
- Keep moisture away from life components. This can lead to short circuits.

Transparent wall connection

WARNING!
Risk of injury from transparent wall connection!

A frameless, closed sliding window may appear invisible and may be overlooked by persons. Walking into the closed door can cause serious injuries.

- In case of doubt, check that the sliding window is open.
- An authorised person must point out the danger to unauthorised persons or persons (including children) who are at risk because of their physical, sensory or mental capabilities or due to lack of experience or awareness.

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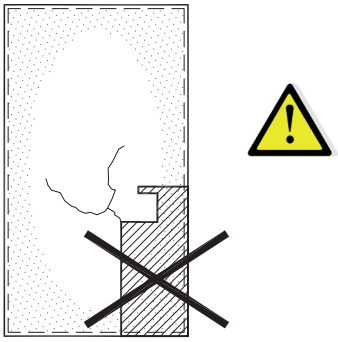
Objects in the immediate vicinity of the door



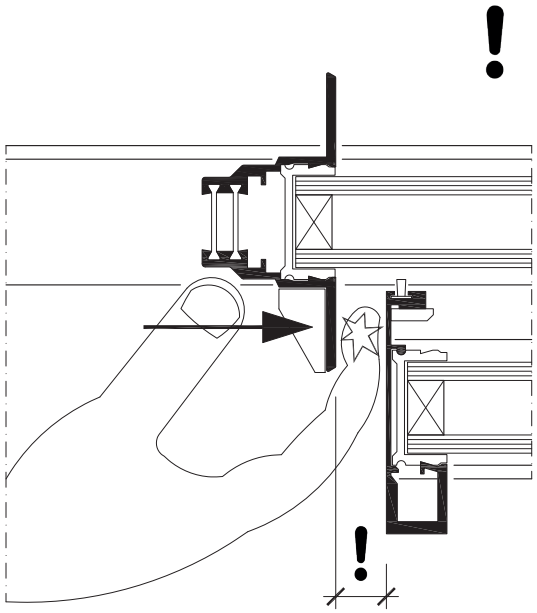
<u>WARNING!</u>
Risk of injury and/or damage to property from selective heating of the glass!

Objects in the immediate vicinity of the window can cause selective heating of the glass in the event of direct insolation and lead to glass breakage*.

- **Do not place objects in the immediate proximity (30 cm) of the sliding window!**

* Only possible when glass configuration differs from standard (TSG-H = tempered safety glass with heat soak test).

Moving components



<u>CAUTION!</u>
Risk of injury from moving components when opening and closing the sliding window!

Moving components can cause injuries when opening and closing the sliding window.

- Before opening and closing the sliding window, ensure that no persons are present in the door area.
- **<u>Do not reach into</u> or handle moving components whilst the door is being opened and closed.**
- Persons (including children) who are incapable of using the equipment safely because of their physical, sensory or mental capabilities or lack of experience or awareness may not use the equipment without supervision or instruction from a responsible person.

2.3 Signs

Only professional electricians may enter a working area marked with this sign.

Unauthorised persons may not enter workplaces or open cabinets marked with this sign.

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Technical data

3. Technical data
3.1 General information

The technical data (dimensions, weights etc.) can be found in the layout plans (delivery drawings) and data sheets.

Controller

Dead man's switch for opening/closing the sliding windows (the panel only moves as long as the switch is pressed).

3.2 Connected load

Voltage (drive)	100 - 240 VAC
Power consumption, max.	1 - 0.42 AAC / drive
Controller (connecting board)	24 VDC max. 300 mA
Frequency	50 / 60 Hz
Protection	13 A
Protection class	IP 20

3.3 Performance values

Power consumption	100 W / drive
Opening / closing speed	5 - 30 cm / s
Opening / closing speed in end area	4 cm / s
Opening / closing force	max. 150 N (15 kg)
Contact pressure in end position	100 N (10 kg)

3.4 Operating conditions

Temperature range	-20°C to +40°C
Humidity	non-condensing
Continuous operating time, max.	10 Minutes
Break until next operation	10 Minutes

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Design and funtionality

4. Design and functionality
4.1 Short description

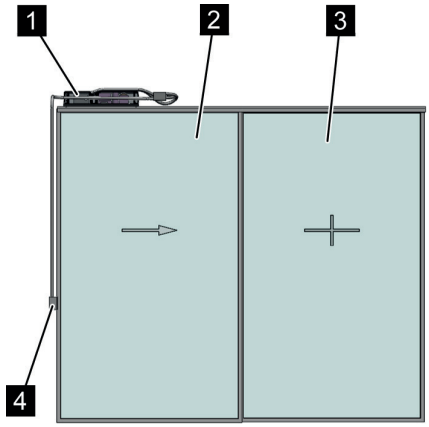

Fig. 1: Single-panel sliding window

The single sliding window consists of a fixed panel (2) and a sliding panel (1).

The sliding panel (1) is opened (arrow) and closed by operating a locking handle (3).

The sliding panel is locked when it is closed and unlocked by the locking handle (3) when it is opened.

1 Sliding panel
2 Fixed panel
3 Locking/opening profile with locking handle

1 Drive
2 Active powered sliding panel
3 Fixed panel
4 Control element (button) - sliding window «Open/Close»

4.2 Types of sliding window

The following types of opening are available:

- Single-panel sliding window [->Page 14.3.4.2]
- Extending sliding window [->Page 14.3.4.2]
- Combined system [->Page 14.3.4.3]

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Power-operated sliding windows SI-1000 Design and funtionality

Single-panel sliding window

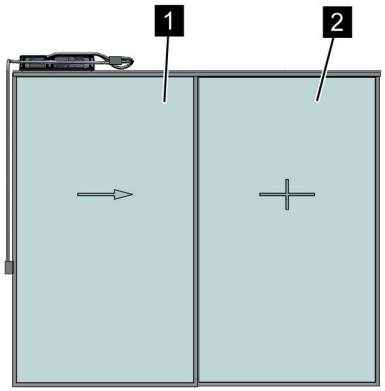

Fig. 2: Single-panel sliding window

Only the sliding panel (1) of the single-panel sliding window moves.

The arrow (Fig. 2) indicates the opening direction.

1 Active powered sliding panel
2 Fixed panel

Extending sliding window

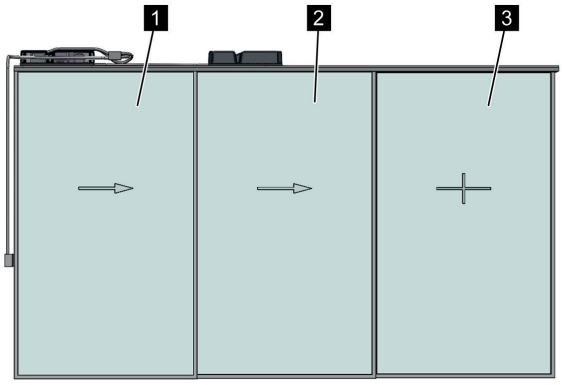

Fig. 3: Right extension

The extending sliding window has two extension panels (1) and (2).

When the door opens (arrows) both extension panels move together until the extension panel (2) slows down and reaches the end position in the fixed panel (3).

The sliding panel (1) continues to open until it also slows down and comes up against the locking profile of the sliding panel (2).

When the door closes, the two extension panels (1) and (2) move together until the extension panel (2) slows down and engages in the fixed panel (3).

The sliding panel (1) continues to move until it slows down and engages in the end position.

The system is locked in this position.

1 Extension panel (Master)
2 Extension panel (Slave)
3 Fixed panel

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Combined system

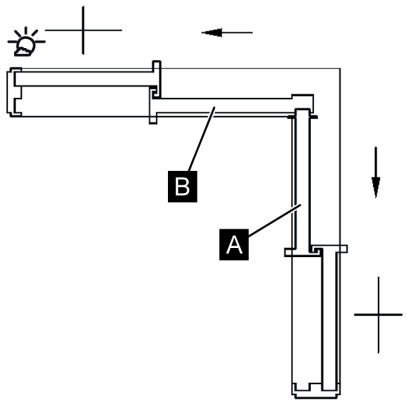

Fig. 4: Combined system, top-down view (single drive left and single drive right)

The single-panel sliding window (Fig. 2) and the extension (Fig. 3) can be combined in different variants to create a system (Fig. 4 and Fig. 5).

A combined system is divided up into system **A** and system **B**.

System **A** is a system that opens first and closes last.

System **B** is a system that opens second and closes first. The arrows (Fig. 4 and Fig. 5) show the opening direction of the systems.

The symbol indicates the outside of the system.

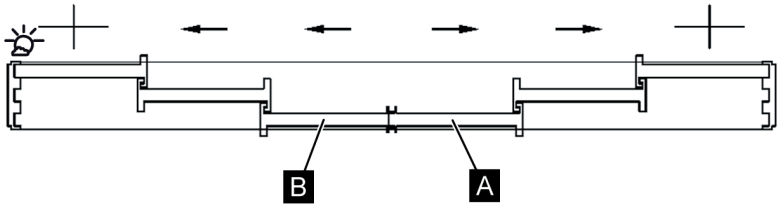

Fig. 5: Combined extending system, top-down view (left extension and right extension)

A combined double extending system (Fig. 5) consists of four sliding panels.

Two of the sliding panels are opened to the right (system **A**) and the other two open to the left (system **B**).

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Design and funtionality

4.3 Electric drive

One drive is needed for each powered sliding panel.

The drive is fixed to the soffit profile and covered with a hood at the top (5) and a service cover at the bottom (6).

The power is transmitted via a toothed belt.

The drive has a self-teaching microprocessor controller that automatically regulates and controls all movements in both directions.

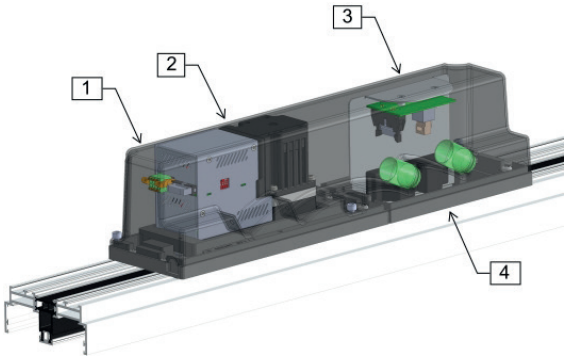

Fig. 6: Drive overview

1 Hood
2 Electric drive SI-1000
3 Connection board
4 Power connection

4.4 Control element

Pressing the button (1) opens the system.
Pressing the button (2) closes the system.

This illustration of the control element is an example and may differ from the button that is actually installed.

Fig. 7: Button - Sliding panel «Open/Close»

1 Button - System «Open»
2 Button - System «Close»

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Power-operated sliding windows SI-1000 Operation

5. Operation
5.1 Operating safety instructions

The system has been manufactured taking the applicable standards and regulations, the state of technology, our knowledge and our many years of experience into consideration.

However, injuries can still occur in the event of improper behaviour.

Please observe the safety instructions explained in the following to avoid dangerous situations.

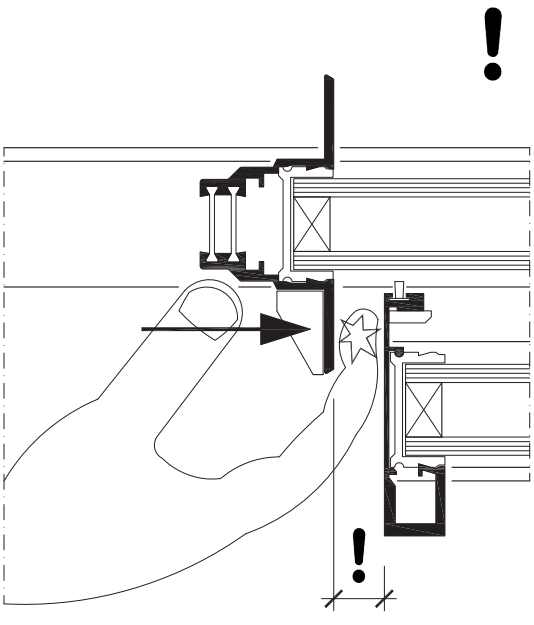
Incorrect operation

WARNING!
Risk of injury from incorrect operation!

Incorrect operation can lead to serious injuries and considerable damage to property.

- The sliding panels must never be bent, twisted or subjected to additional loads.
- Do not place objects in the door area between the sliding panels and the frame.
- Never slacken screws or remove them from the system.

Moving components



CAUTION!
Risk of injury from moving components when opening and closing the sliding window!

Moving components can cause injuries when opening and closing the sliding window.

- Before opening and closing the sliding window, ensure that no persons are present in the door area.

- Do not reach into or handle moving components whilst the door is being opened and closed.

- Persons (including children) who are incapable of using the equipment safely because of their physical, sensory or mental capabilities or lack of experience or awareness may not use the equipment without supervision or instruction from a responsible person.

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Danger areas

The marked dots in the illustration (Fig. 8) show the possible danger areas on the system, where persons are at risk of injury in the event of improper behaviour.

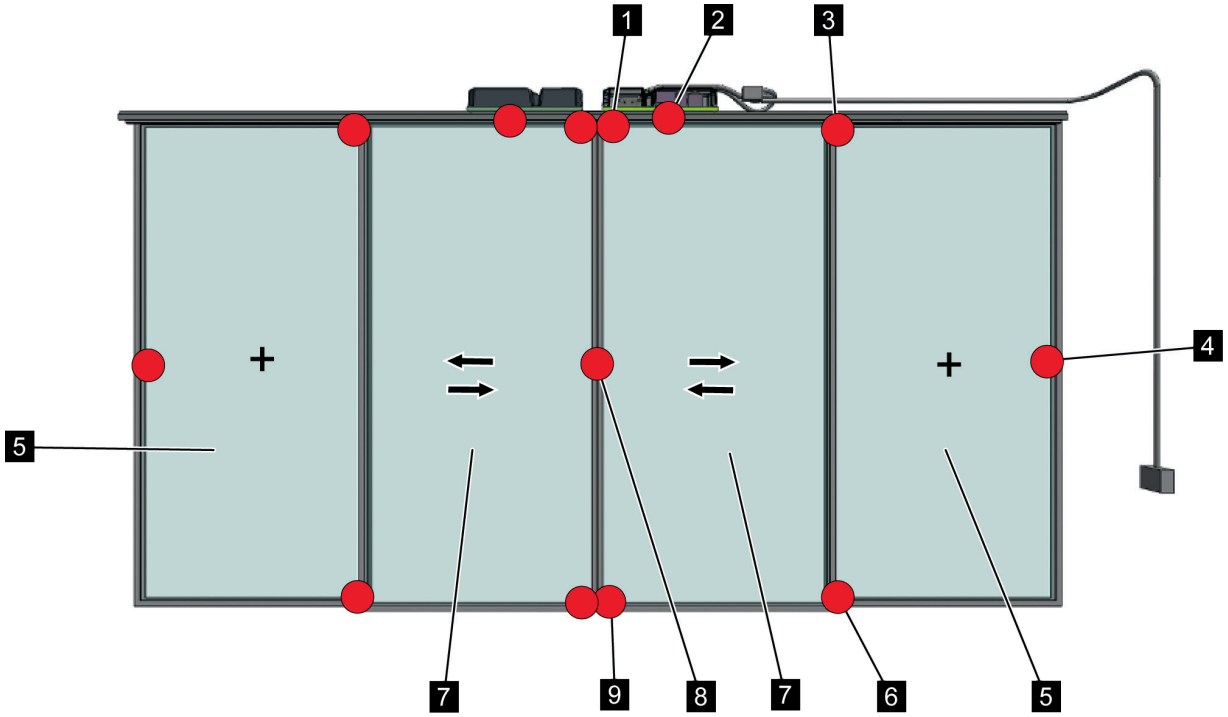

Fig. 8: Danger areas

1 Between top edge of panel and runner when closing
2 At the drive belt when closing and opening
3 Between top edge of panel and runner when opening
4 Between sliding panels and between active sliding panel and frame when opening
5 Fixed panel
6 Between bottom edge of panel and runner when opening
7 Sliding panel
8 Between sliding panels and between sliding panel and frame when closing
9 Between bottom edge of panel and runner when closing

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5.2 Opening/closing the sliding windows

The active powered panels are locked when closing and unlocked automatically when opening.

5.2.1 Single-panel sliding window+extension

The method of operation of the single-panel sliding window and the sliding window extension is identical.

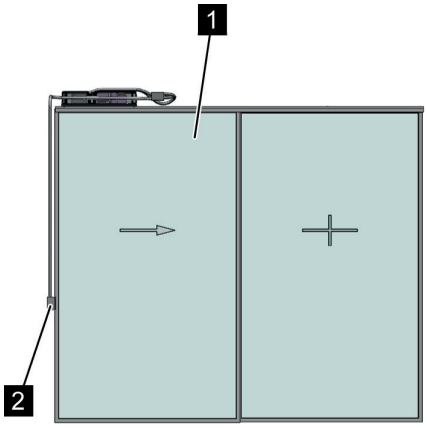

Fig. 9: Single-panel sliding window

1 Active powered panel
2 Control element

Opening the sliding window:

1. Ensure that no living beings or objects are in the door area.

2. Press button (3) «Open» at control element and hold down -> the sliding window opens for as long as the button (3) is pressed.

Closing the sliding window:

1. Ensure that no living beings or objects are in the door area.

2. Press button (4) «Close» at control element and hold down -> the sliding window closes for as long as the button (4) is pressed.

If the system encounters an obstacle, all movements stop. To continue, press the relevant control button «Open» or «Close» again on the control element.

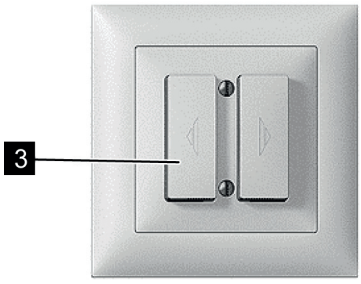

Fig. 10: Control element (example)

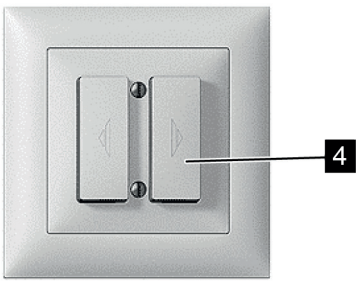

Fig. 11: Control element (example)

CAUTION!
Pushing the window against the direction of travel will cause damage!

Sliding the sliding panel against the direction of travel can damage the drive and cause it to fail.

- Never slide a sliding panel against the direction of travel.

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Operation

5.2.2 Opening / closing a combined system

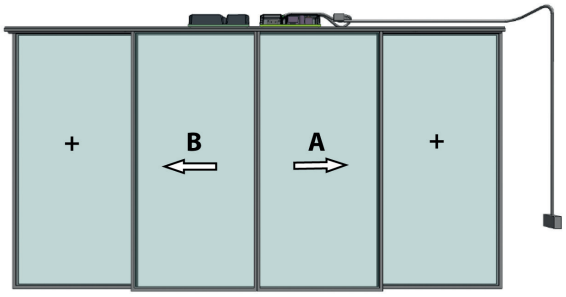
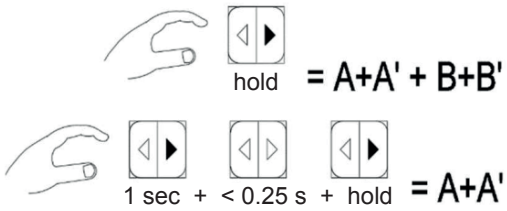


Fig. 12: Two-panels system



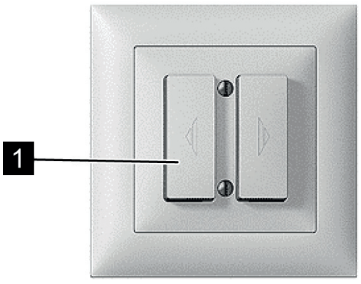


Fig. 13: Control element (example)

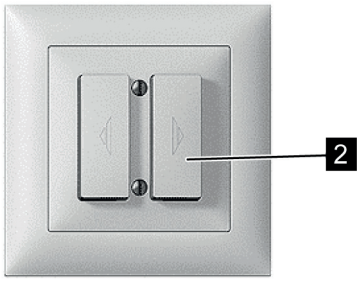


Fig. 14: Control element (example)

In combined systems, system **A** (Fig. 12) is opened first and closed last.

Opening the sliding windows:

1. Ensure that no living beings or objects are in the door area.

Standard / factory setting:

2. Press button (1) «Open» at control element and hold down -> the WHOLE system **A+B** (Fig. 12) opens for as long as the button (1) is pressed.

   If the control button is briefly released and pressed again (double-click), ONLY system **A** will open.

NOTE:
Optionally, the press-sequence can be changed so that only the system **A** will opened when the button is held, and **A+B** is opened by double-clicking.

Closing the sliding windows:

1. Ensure that no living beings or objects are in the door area.

2. Press button (2) «Close» at control element and hold down -> the closing procedure is fully automatic.

If the system encounters an obstacle, all movements stop. To continue, press the relevant control button «Open» or «Close» again on the control element.

CAUTION!
Pushing the window against the direction of travel will cause damage! [->Chap.5.2.1]

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5.2.3 Opening / closing the doors manually

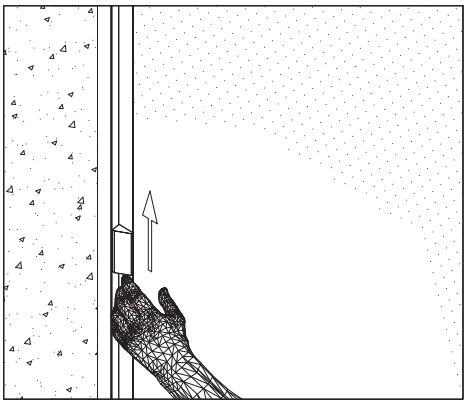

Fig. 15: Unlocking the bolt

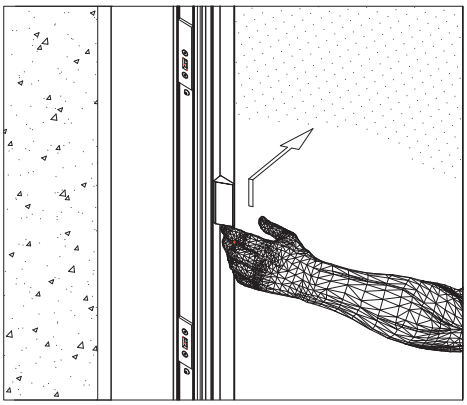

Fig. 16: Opening the sliding window

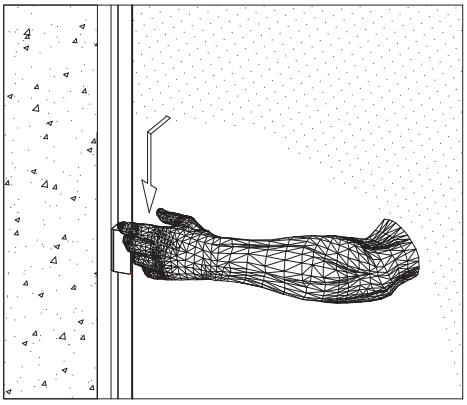

Fig. 17: Locking the sliding window

Electrically operated systems can be unlocked and opened or closed manually at any time.

Opening the sliding window manually:

1. Slide locking handle upwards (arrow) and hold in this position.

-> The sliding window is unlocked.

2. Ensure that no living beings or objects are in the door area.

CAUTION!
Risk of damage from uncontrolled opening and closing of the sliding panels!

Uncontrolled opening and closing of the sliding panels can cause a considerable amount of damage.

- Move sliding panels slowly when opening and closing.
- Ensure that the sliding panel is moved along the frame extremely slowly, and that it does not bump against it in an uncontrolled way when it reaches the end position.

3. Open sliding panel slowly (arrow).

Closing the sliding window manually:

1. To close the sliding window manually, slide it as far as it will go and **slide the locking handle downwards manually** to lock.

2. Ensure that the sliding window is locked.

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5.3 Reference run (power failure)

After a power failure, the system requires a reference run to re-check the positions of the end points.

The reference run is started **automatically** after pressing the «Open» or «Close» control button after the power has been restored.

WARNING!
Risk of injury from reference run!

The reference run is started automatically when the power has been restored and a control button is pressed. If persons are present in the door area during the reference run, they may be injured.

- Before pressing the control button on the control element, always ensure that no persons are present in the door area.

When a control button is pressed, the system **automatically** performs a slow search run (open / closed / open, depending on the situation).

The system remains in the open position after the reference run.

Then the systems revert to normal operation and can be operated accordingly using the buttons.

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Maintenance

6. Maintenance

The system must be checked annually by an expert from a specialist company. See last page for contact information.

No warranty or service claims will be entertained if maintenance is not carried out properly.

6.1 Maintenance safety instructions

Improper maintenance

WARNING!
Risk of injury from improper maintenance!

Improper maintenance can lead to serious injuries.

- Never undo screws on the system and remove the service cover.

- Apart from the cleaning work that is described, all maintenance work must be carried out by the expert from the specialist company.

Cleaning

WARNING!
Risk of injury from unintentional button pressing!

When the system and the control buttons are being cleaned, there is a risk of initiating unintentional system movements by touching the control buttons.

This represents a risk of injury to persons in the danger zone.

- During cleaning work on the system, ensure that no persons can unintentionally press any of the control buttons.

- Before cleaning the control buttons, ensure that no persons are present in the door area.

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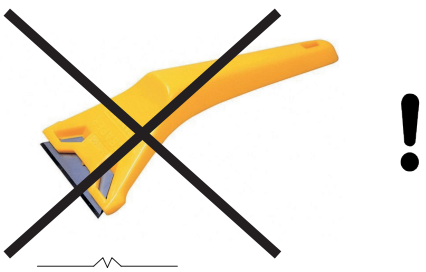
Cleaning and care

6.2 Cleaning and care

1. Clean panes of glass with a soft cloth and a normal commercial glass cleaner.
2. Gently clean control buttons with a damp cloth and a mild cleaning agent. Do not allow liquids to penetrate the control element between the pushbuttons.
3. Remove soiling from base profile with a vacuum cleaner.
4. Clean base profile with a damp cloth and a liquid cleaning agent.
5. Check the gutter for soiling and clean if necessary.
6. Ensure that the water can flow away in the gutter.
7. Remove all tools, materials and other equipment from the working area.



CAUTION:
Improper cleaning can cause damage!

Improper cleaning can lead to extensive damage to property.

- **NEVER use metal blades / glass scrapers!**
  These can cause severe damage to TSG-HST glass.

- Do not use abrasive or scouring material.
- Never use cleaning agents containing solvent or scouring material.
- Do not use alkalis (lyes).
- Grains of dirt in cloths can scratch the panes of glass.
- The use of a high pressure washer is not recommended for cleaning.

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Power-operated sliding windows SI-1000
Cleaning and care

Seals

The seals have been treated with silicone in the factory to prevent them from freezing on.

If this protection has deteriorated over time, proceed as follows:

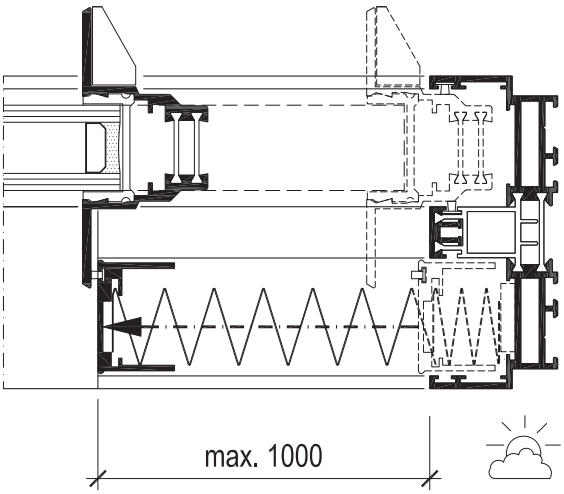
1. Spray silicone spray onto a cloth outdoors.

2. Apply silicone spray to the seals using the cloth.

NOTE:
Damage caused by road salt!

Road salt can damage the sliding windows. Avoid use of road salt in the immediate vicinity of the sliding window.

Insect screen



Clean frame, handle profile and fabric with soapy water and a soft cloth.

TIP:
The fabric can also be cleaned by blowing through it from the inside to the outside using compressed air or a hair dryer (using cold air).

CAUTION:
NEVER use chemical or abrasive materials!

In strong winds, the insect screens must be closed immediately (risk of damage).

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Power-operated sliding windows SI-1000
Trouble-shooting

7. Trouble-shooting

The possible causes of faults and the work that is required to remedy them are described in the following chapter. Please contact specialist company in the event of faults that cannot be remedied using the following instructions. See on last page for contact information.

7.1 Debugging the system

Sliding panel cannot be moved:
- Electrical energy supply interrupted -> Check electrical energy supply
- Person or object trapped between sliding panel and frame -> Free person or remove object

System closing automatically, although the «Open» button was pressed / System opening automatically, although the «Close» button was pressed -> Reference run started by pressing control button after power failure -> Wait until reference run complete [Chap.5.3].

System moving slowly:
- Heavy soiling in movement area -> Clean system [->6.2].
- Damage to system -> Contact a specialist company.

WARNING!
Risk of injury from incorrect repair!

Attempts to repair the system by an insufficiently qualified person can result in serious injuries and damage to property.

- Never dismantle the system.
- Never repair or modify the system yourself.

WARNING!
Risk of injury from using the wrong spare parts!

The use of wrong or defective spare parts or failing to install them correctly can put the user at risk and cause damage.

- Always have defective parts replaced by a specialist company.

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Power-operated sliding windows SI-1000
Trouble-shooting

External condensation

The external glass is in a direct "radiation exchange" with the sky. Depending on the installation situation, this radiation exchange can now lead to considerable cooling of the external glass (particularly on clear nights).

If the temperature of the outer glass surface drops below the temperature of the adjacent outside air, this will result in the formation of condensation on the outer surface of the glass (even ice in certain cases).

This procedure is generally known in nature as dew or hoar frost formation.

Heating of the outer surface and the outside air (by the morning sun, for example) will cause the condensation to disappear again.

This phenomenon is not a malfunction, but is **an indication of the outstanding heat insulation** and the functionality of the insulating glass that is used.

The following generally applies to any insulating glass:
The lower the heat transmission (the smaller the U_g value or also: the better the insulating glass) the warmer the glass remains at the room side and therefore the colder the outside glass, which may become fogged.

Because of the improved insulation of triple-glazed units, condensation is more likely to form on the surface of the outer glass layer more frequently than with double-glazed units.

Internal condensation

The formation of dew on the room-side pane of glass is assisted if the air circulation is blocked (protruding soffits, curtains, unfavourable radiator arrangement, lack of ventilation) and the ambient air is too humid.

The ambient humidity must be adapted to the situation accordingly (dehumidifier, convector).

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Power-operated sliding windows SI-1000
Dismantling and disposal

8. Dismantling and disposal

When the system reaches the end of its service life, it must be dismantled and disposed of in an environmentally friendly way.

WARNING!
Risk of fatal injury from incorrect dismantling!

Problems that occur during dismantling can lead to life-threatening situations or cause a considerable amount of damage.

- Only allow experts from the specialist company to dismantle the system.
- Do not dismantle the equipment or make local modifications yourself.

NOTES:

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Sky-Frame partner: