

Roto Patio Fold

Premium hardware
for Fold&Slide systems with a large surface

Installation, maintenance and operation instructions
for timber, timber/aluminium and PVC profiles



General information	Information on these instructions 6	
	Responsibility of the target groups 8	
	Instruction obligation of the target groups 9	
	Explanation of the safety instruction symbols 10	
	Limitation of liability 11	

Security	Stipulated use 12	
	Stipulated application for end-users 14	
	Safety instructions 16	
	Safety information for end-users 19	
	Fabrication advice 20	
	Screw fixing/Clamping 21	

Information on the product	General hardware characteristics 22	
	Explanation of the digit string 23	
	Possible combinations: 24	
	Bottom-running frame 24	
	Top-running frame 25	
	Bottom-running enhanced threshold 26	

Hardware overview	Explanation on the hardware overview chapter 27	
	Version standard roller track 28	
	Parts list standard roller track 29	
	Version enhanced threshold 32	
	Parts list enhanced threshold 33	
	List of profile systems 36	
	Drilling jigs 38	

Installation	Drilling and routing dimensions 39	
	Predrilling sash/frame hinges 41	
	Predrilling support bracket 44	
	Sash 46	
	Mounting top support bracket 46	
	Mounting support bracket for bottom roller track 47	
	Mounting support bracket for bottom enhanced threshold 48	
	Installing the sash hinge-bearing 51	
	Installing the sash hinge 54	



Connecting folding sashes to each other.....	57
Drilling and installing the corner hinge	59
Frame	60
Installing roller track and guide track.....	60
Installing roller track with roll-support	61
Drilling drainage drill-holes	62
Installing contour-milled frame	64
Installing the frame counter-routed.....	68
Drilling and installing the stay bearing	70
Drilling and installing the pivot rest.....	71
Supporting the roller track and the enhanced threshold.....	73
Inserting the bogie.....	74
Installing the frame hinge-bearing	75
Connecting sash and frame	76
Hinging the sash	76
Advice on the use of glazing packers.....	78
Frontal view support bracket	78
Accessories	79
Installing the sash retaining device.....	79
Installing the sash stop	80



Installation drawings

Dimensions and positioning.....	81
Timber.....	81
Timber-aluminium.....	82
PVC.....	83



Adjustment

Explanation on the adjustment chapter.....	84
Bogie / hinge.....	85
Adjustments: gasket compression, lateral and height.....	85
Locking cam	86
E / P / V cam	86
V cam, extended	87



Operation

Operating information.....	88
Opening Fold&Slide doors	88



Maintenance

Maintenance.....	89
Lubrication points.....	90
Inspection and care	91
Preservation of the surface finish	92

Dismantling	Unhinging the sash.....	94	
Transport	Transport, packaging, storage	95	
	Transport inspection	96	
Disposal	Disposal of window hardware	97	

This manual contains important information, instructions and application diagrams (maximum sash sizes and sash weights) as well as installation instructions regarding the further work of the hardware.

Also, this manual contains binding guidelines to ensure the duty to instruct through to the end-user.

The information and instructions in this manual refer to the products of the Roto Patio hardware system.

Apart from these installation, maintenance and operation instructions, the following documents apply:

- Directives TBDK of the Quality Assurance Association: Locks and Hardware (Richtlinie TBDK der Gütegemeinschaft Schlösser und Beschläge e. V.)
- Directives VHBH of the Quality Assurance Association: Locks and Hardware (Richtlinie VHBH der Gütegemeinschaft Schlösser und Beschläge e. V.)
- Directives VHBE of the Quality Assurance Association: Locks and Hardware (Richtlinie VHBE der Gütegemeinschaft Schlösser und Beschläge e. V.)
- RAL Installation guideline

This manual should be stored in such a manner that it can be quickly used, if needed.

Additional markings

To highlight handling directives, results, lists, references and other elements, the following signs are used in this manual:

Marking	Explanation
	Sash
	Frame
	Drill holes
	Hardware components
	Action steps
	First level of the hierarchy in a list
	Unordered list (second level of the hierarchy)
	(Cross) reference in tables
	(Cross) reference in the text

Abbreviation	Explanation
III.	Illustration
AD	Coverage
FRCL	Frame clearance
SRW	Sash rebate width
SRH	Sash rebate height
H	Timber
K	PVC
KBS	Enhanced threshold
L	DIN left (view from inside)
Material no.	Material number
TEFF	Top edge of finished floor
R	DIN right (view from inside)
FEW	Frame external width
FEH	Frame external height
FRW	Frame rebate width
FRH	Frame rebate height
SG	Shadow gap
OH	Overlap height
unc.	uncoated

All dimensions stated in mm.

Protection of copyright

The contents of this manual are protected by copyright. In the framework of the hardware manufacturing, the use of the contents is allowed. Any other or further use is not permitted without written permission of the manufacturer.

The information in this document is intended for the following target groups:

Hardware dealers

The “hardware dealers” target group includes all companies/persons who purchase hardware from the hardware manufacturer to resell it without the hardware being modified or subjected to further work.

Manufacturers of windows and balcony doors

The “manufacturers of windows and balcony doors” target group includes all companies/persons who purchase hardware from the hardware manufacturer or the hardware dealer and build it into windows and balcony doors.

Building element dealers/Installation company

The “building element dealers” target group includes all companies/persons who purchase windows and balcony doors from the manufacturer of windows and balcony doors in order to sell these on and to install them into a building development, without the windows or balcony doors being modified.

The “installation company” target group includes all companies/persons who purchase windows and balcony doors from the manufacturer of windows and balcony doors, or from a building element dealer, in order to sell these and to install them into a building development, without the windows or balcony doors being modified.

Builder

The “builder” target group includes all companies/persons who order windows and/or balcony doors for installation into their building project.

End-users

The “end-users” target group includes all persons who operate the installed windows and/or balcony doors.

**NOTE!**

Every target group must fully comply with its instruction obligation. Unless defined otherwise in the following, the documents and information may be transmitted e.g. as printed documents, CD-ROM, or via Internet access.

Responsibility of the hardware dealer

The hardware dealer must transmit the following documents to the manufacturer of windows and balcony doors:

- Installation, maintenance and operation instructions
- Directive for fixing load-bearing Turn-Only and Tilt&Turn hardware components (TBDK)
- Guidelines/advice on the product and on liability (VHBH)
- Specifications/information for end-users (VHBE)

Responsibility of the manufacturer of windows and balcony doors

The manufacturer of windows and balcony doors must transmit the following documents to the building element dealer or to the builder, even when a subcontractor (installation company) is acting as an intermediary:

- Installation, maintenance and operation instructions
- Directive for fixing load-bearing Turn-Only and Tilt&Turn hardware components (TBDK)
- Guidelines/advice on the product and on liability (VHBH)
- Specifications/information for end-users (VHBE)

He must ensure that the end-user is provided with the documents and information intended for him, in printed format.

Responsibility of the building element dealer/installation company

The building element dealer must transmit the following documents to the builder, even when a subcontractor (installation company) is acting as an intermediary:

- Maintenance and operating instructions (with the focus on hardware)
- Guidelines/advice on the product and on liability (VHBH)
- Specifications/information for end-users (VHBE)

Responsibility of the builder

The builder must transmit the following documents to the end-user:

- Maintenance and operating instructions (with the focus on hardware)
- Specifications/information for end-users (VHBE)

In this instructions, safety information is indicated by a symbol. The safety information is introduced by a key word that indicates the severity of the danger.

**DANGER!**

This symbol in conjunction with the signal word indicates an imminently hazardous situation, which could result in death or serious damage to health if it is not avoided.

**WARNING!**

This symbol in conjunction with the signal word indicates a potentially dangerous situation, which could result in death or serious damage to health if it is not avoided.

**CAUTION!**

This symbol in conjunction with the signal word indicates a potentially dangerous situation, which may lead to minor or light injuries if it is not avoided.

**NOTE!**

This symbol in conjunction with the signal word indicates a potentially dangerous situation, which may lead to property or environmental damage if it is not avoided.

All details and instructions in this document were compiled taking into account the relevant standards and regulations, the state of the art, and also many years of knowledge and experience.

The hardware manufacturer accepts no liability for damages resulting from:

- Failure to comply with this document and all product-specific documents and related applicable directives (refer to the chapters Security and Stipulated use).
- Non-stipulated use/misuse (refer to the chapters Security and Stipulated use).
- Insufficient invitation to tender, failure to adhere to the installation instructions or application drawings.
- Increased soiling.

Claims by third parties against the hardware manufacturer on the ground of damages resulting from misuse or failure to follow the instruction obligation on the part of the hardware dealer, the manufacturer of windows and balcony doors, and of the building element dealer or the builder are transferred accordingly.

The undertakings agreed in the delivery contract, the general conditions of business and the delivery conditions of the hardware manufacturer, and the legal regulations applicable at the time of concluding a contract are effective.

The warranty covers only original Roto components.

The right to technical modifications for the improvement of performance characteristics and for further development is reserved.

Turn-Only and Tilt&Turn hardware as covered by this definition is one-hand-operation hardware, Turn-Only and Tilt&Turn hardware for windows and balcony doors in building construction. This is used to enable windows and balcony-door sashes into a turning position by operating a 'hand-lever' (handle) or into a limited tilting position in the case of the scissors (sash-stay) version. Turn-Only and Tilt&Turn hardware is used on vertically installed windows and balcony doors made of aluminium. Turn-Only and Tilt&Turn hardware as covered by this definition, locks window and balcony door sashes or enables various ventilating positions. When closing, the gasket counter force must be overcome as a rule.

Correct use also includes adhering to all the specifications in the product-specific documents, such as:

- These installation, maintenance and operation instructions
- Product catalogues
- Information and specifications of the profile manufacturer (e.g. light metal profiles etc.)
- The relevant directives TBDK, VHBH and VHBE of the Quality Assurance Association: Locks and Hardware (Gütegemeinschaft Schlösser und Beschläge e. V.)
- The valid national laws and directives

Any type of use that goes beyond or differs from the defined correct use shall be regarded as misuse.

**WARNING!****Danger from misuse!**

Misuse and incorrect installation of hardware can result in hazardous situations.

- Never use hardware combinations that have not been approved by the hardware manufacturer.
 - Never use accessories that are not original products or that have not been approved by the hardware manufacturer.
-



Sliding hardware as well as Fold&Slide hardware is hardware for sliding sashes for windows and balcony doors that are mainly used as glazed exterior structures.

In combination with the sliding sashes, fixed-glazing-units and/or further sashes can be situated in a window element.

Sliding hardware is equipped with a locking mechanism that fastens the sliding sash. Sliding hardware is equipped with rollers that are mainly located on the bottom horizontal plane of the sliding sash.

In addition, scissor stay-arms for tilting and mechanisms to lift and/or parallel-retract the sashes can be specified. By means of the hardware, the sashes are locked, brought into the ventilation position and pushed to the side.

Sliding hardware is solely used for further processing of vertically installed windows and balcony door sashes made of timber or PVC, and their corresponding material combinations.



NOTE!

Depending on the outside temperature, relative air humidity of the ambient air, as well as the application location of the sliding element, a temporary formation of condensation water on the aluminium tracks on the inside may occur. This is particularly promoted when the air circulation is hindered; for example due to deep reveals, curtains as well as unfavourable radiator positioning and the like.

Correct use also includes adhering to all the specifications in the product-specific documents, such as:

- These installation, maintenance and operation instructions
- Product catalogues
- Information and specifications of the profile manufacturer (e.g. PVC or light metal profiles etc.)
- The relevant directives VHBH and VHBE of the Quality Assurance Association: Locks and Hardware (Gütegemeinschaft Schlösser und Beschläge e. V.)
- The valid national laws and directives

Any type of use that goes beyond or differs from the defined correct use shall be regarded as misuse.



WARNING!

Danger from misuse!

Misuse and incorrect installation of hardware can result in hazardous situations.

- Never use hardware combinations that have not been approved by the hardware manufacturer.
- Never use accessories that are not original products or that have not been approved by the hardware manufacturer.

For windows and balcony doors with Turn-Only and Tilt&Turn hardware, window and balcony door sashes can be brought into a turn position or into a limited tilting position by means of the scissor stay.

When a sash is closed and the hardware is locked, the resistance of a gasket usually needs to be overcome.



WARNING!**Danger of injury and material damage from incorrect closing and opening the sash!**

Incorrect closing and opening of sashes can result in serious injuries and significant material damage.

Therefore:

- Ensure that when closing the sash, it does not collide with the frame or with another sash.
 - Ensure that the sash is guided slowly by hand throughout the entire range of movement as far as the fully closed position, and that it is brought very slowly towards the frame.
 - Ensure that the sash never slams closed or swings open in an uncontrolled manner.
-

Any use beyond or other than the stipulated application and installation of the products is deemed to be misuse and can result in dangerous circumstances.



WARNING!**Danger from misuse!**

Misuse of windows and balcony doors can result in dangerous circumstances.

In particular, avoid the following applications:

- insertion of obstacles in the opening area between the frame and the window and balcony door sashes,
 - the deliberate or negligent application of excessive loads on windows or balcony doors,
 - deliberate or uncontrolled slamming or pushing of windows and balcony doors against the window reveal. This can destroy the hardware, frame materials, or other individual components of the windows or balcony doors.
-

Claims for damages of any type whatsoever resulting of operation other than that stipulated are excluded.



On windows or balcony doors with sliding hardware the sashes can be moved horizontally or vertically by operating a 'hand-lever' (handle).
On special constructions the sashes additionally can be folded by sliding (like an accordion – Fold&Slide windows).
On special constructions some of the sashes additionally can be brought into a turning position and/or into a limited tilting position in the case of the scissors (sash-stay) version.
When a sash is closed and the hardware is locked, the resistance of a gasket usually needs to be overcome.

**WARNING!****Danger of injury and material damage from incorrect closing and opening the sash!**

Incorrect closing and opening of sashes can result in serious injuries and significant material damage.

Therefore:

- Ensure that when opening or closing the sash, it does not collide with the frame or with another sash.
- Ensure that the sash is guided slowly by hand throughout the entire range of movement as far as the fully opened or closed position, and that it is brought very slowly towards the frame, the opening restrictor or another sash (technical value – maximum reference speed of the closing edge $v \leq 0.2 \text{ m/s}$).

Any use beyond or other than the stipulated application and installation of the products is deemed to be misuse and can result in dangerous circumstances.

**WARNING!****Danger from misuse!**

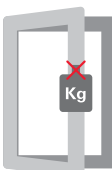
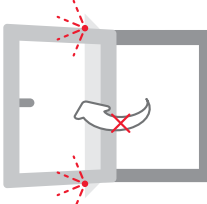
Misuse of windows and balcony doors can result in dangerous circumstances.

In particular, avoid the following applications:

- insertion of obstacles in the opening area between the frame and the window and balcony door sashes,
- the deliberate or negligent application of excessive loads on windows or balcony doors,
- deliberate or uncontrolled slamming or pushing of windows and balcony doors against the window reveal. This can destroy the hardware, frame materials, or other individual components of the windows or balcony doors.

Claims for damages of any type whatsoever resulting of operation other than that stipulated are excluded.

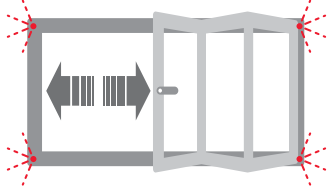
Comply with the following symbols and their meanings in order to avoid accidents, injuries and material damage.

Symbol	Meaning
	DANGER! Danger of injury from falling through open windows and balcony doors. - Proceed cautiously in the vicinity of open windows and balcony doors. - Please keep children and persons that cannot appreciate the danger away from the hazard area.
	WARNING! Danger of injury through trapping of body parts in the opening gap between sash and frame. - When closing windows and balcony doors, never reach between sash and frame, and always act with care. - Please keep children and persons that cannot appreciate the danger away from the hazard area.
	WARNING! Danger of injury and material damage from overloading the sash Refrain from additionally loading the sash.
	CAUTION! Danger of injury from the effect of wind - Prevent wind from acting on the open sash. - During wind and drafts, close and lock windows and balcony door sashes.
	CAUTION! Danger of injury and material damage from insertion of obstructions into the opening gap between sash and frame Refrain from inserting obstacles in the opening gap between the sash and the frame.
	CAUTION! Danger of injury and material damage from pressing the sash against the opening edge (reveal) Do not press the sash against the opening edge (reveal).



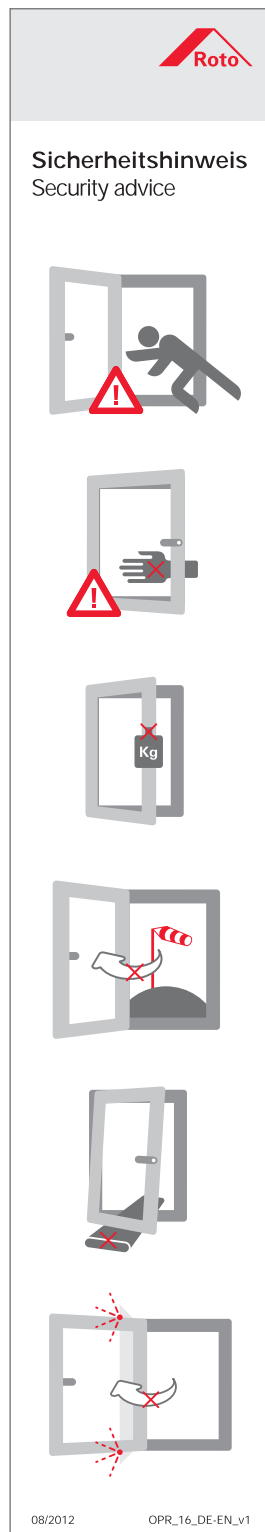
Comply with the following symbols and their meanings in order to avoid accidents, injuries and material damage.

Symbol	Meaning
	DANGER! Danger of injury from falling through open windows and balcony doors. - Proceed cautiously in the vicinity of open windows and balcony doors. - Please keep children and persons that cannot appreciate the danger away from the hazard area.
	WARNING! Danger of injury through trapping of body parts in the opening gap between sash and frame. - When closing windows and balcony doors, never reach between sash and frame, and always act with care. - Please keep children and persons that cannot appreciate the danger away from the hazard area.
	WARNING! Danger of injury and material damage from overloading the sash Refrain from additionally loading the sash.
	CAUTION! Danger of injury from the effect of wind - Prevent wind from acting on the open sash. - During wind and drafts, close and lock windows and balcony door sashes.
	CAUTION! Danger of injury and material damage from insertion of obstructions into the opening gap between sash and frame Refrain from inserting obstacles in the opening gap between the sash and the frame.

Symbol	Meaning
	 CAUTION! Danger of injury and material damage from pressing the sash against the opening edge (reveal) and from uncontrolled opening and closing of the sash ▪ Do not press the sash against the opening edge (reveal). ▪ Ensure that the sash is guided slowly by hand throughout the entire range of movement as far as the fully opened or closed position.



The following symbols can be used on windows and balcony doors to protect the end-user. Always keep these symbols in a clearly legible state. Please order stickers separately (OPR_16_DE-EN).



Maximum sash sizes and weights

The technical data, application diagrams, and component classifications in the product-specific documentation of the hardware manufacturer give instructions on the maximum permitted sash sizes and weights. Here, the component with the smallest permitted load bearing capacity decides the maximum permitted sash weight.

- Check compliance of the technical data, application diagrams, and component classifications before the use of electronic data sets, and especially their use in fenestration programmes.
- The maximum permitted sash sizes and weights must never be exceeded. In the case of uncertainty contact the hardware manufacturer.

Specifications for profile manufacturers

The manufacturer of windows and/or balcony doors must comply with all specified system-related dimensions (e.g. gasket gap dimensions or locking-point distances). Furthermore, he must check these regularly and make certain of them, especially on the first use of new hardware components, during manufacture, in an ongoing manner up to and including the window installation.

Specifications for fabricators

In the area of the support brackets, cut the reinforcements to mitre and push forward into the sash edges. Do not place sashes with already fitted hardware components against or on top of each other, thereby placing stress on the projecting support brackets. Seal all the outer components on the profile-side assembly surfaces to prevent moisture from entering.



NOTE!

The hardware components are designed in such a manner, that the system-related dimensions can be adjusted, provided the hardware can have an effect on these. If a deviation from these dimensions is noticed only after the installation of the windows, the hardware manufacturer is not responsible for any possible additional work arising.

Composition of hardware

Burglary inhibiting windows and balcony doors require hardware which fulfils particular requirements.

Windows and balcony doors for damp rooms, and those for use in environments with aggressive and corrosive air components require hardware which fulfils particular requirements.

The resistance of windows and balcony doors to wind loads when closed and locked depends on the actual designs of the windows and balcony doors. Wind loads prescribed by law and standards (e.g. as per EN 12210 – especially test pressure P3) can be dissipated by the hardware system.

The hardware combinations and installations appropriate for windows and balcony doors in the previously mentioned areas should be specifically selected and agreed with the hardware manufacturer and the profile manufacturer.



NOTE!

The guidelines of the hardware manufacturer relating to the combination of the hardware (e.g. the use of additional stay arms, the design of hardware for burglary-inhibiting sashes for windows and balcony doors, etc.) are binding.



DANGER!

Danger to life from incorrectly installed and threaded hardware components!

Incorrect installation and threading of hardware components can result in dangerous circumstances and cause severe accidents, even including death.

Therefore:

- For installation and especially for threaded components, observe the product-specific documentation of the hardware manufacturer, the information from the profile manufacturer, and all contents of the TBDK directive of the Gütegemeinschaft Schlösser und Beschläge e. V.
 - The window fabricator must ensure adequate fixing of the hardware components and correct load transfer.
-

This danger note shall apply to all screwable hardware components and particularly to those safety components which are part of the RC equipment. Generally, the kind and quality of the screw fixing depends on the aluminium profile of the profile manufacturer and has to be tested before use (system check).

Do not use any acid cross-linked sealing compounds that could lead to corrosion of the hardware components. The glazing spacer-block regulations for the glazing method are to be adhered to.

Roto Patio Fold

- Concealed central locking system for one-hand-operation
- Optional top or bottom running door elements
- Inward or outward opening
- Silver anodised roller tracks and guide tracks
- Coloured cover strips
- Powder-coated hinges and support brackets
- Standard colours:
 - White R07.2
 - Medium bronze R05.3
 - Silver R01.1
 - Raw (for on-site coating)
- Tilt&Turn or Turn-Only sash as the access sash
- Retro-adjustable components
- Additional possibilities:
 - Roto security components, MVS
- Area of use:
 - Sash rebate width SRW at least 450 mm – max. 1200 mm
(access sash on the frame side)
 - Sash rebate width SRW at least 450 mm – max. 900 mm (folding sash)
 - Sash rebate height SRH at least 600 mm – max. 2800 mm
 - Sash weight S.kg max. 100 kg (for bottom-running version)
 - Sash weight S.kg max. 80 kg (for top-running version)
- Roller track length max. 6 m



Explanation of the digit string in the diagrams

A mirror image of each diagram can also be implemented.

Number of sashes that open to the left
532

Total number of sashes

Number of sashes that open to the right

For explanation of the letters (A-F) please refer to the dimensioned drawing on page 73.

DIAGRAM 321

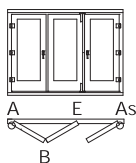


DIAGRAM 330

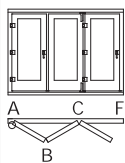


DIAGRAM 431

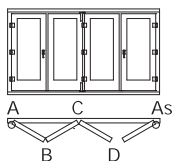


DIAGRAM 532

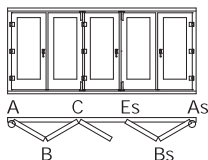


DIAGRAM 541

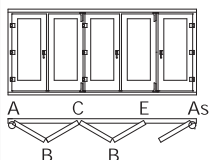


DIAGRAM 550

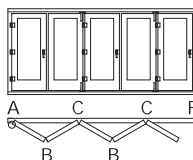


DIAGRAM 633

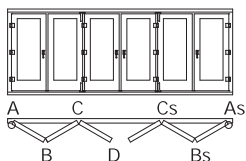


DIAGRAM 651

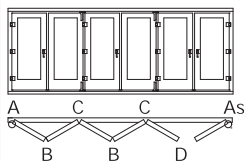


DIAGRAM 743

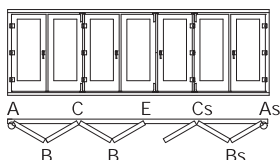


DIAGRAM 752

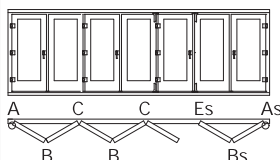


DIAGRAM 761

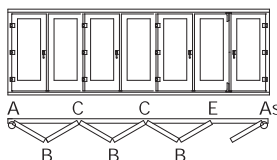


DIAGRAM 770

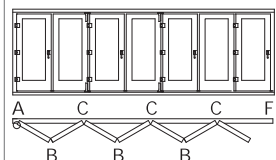
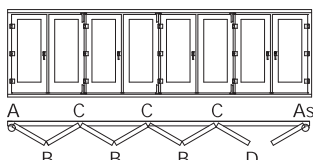
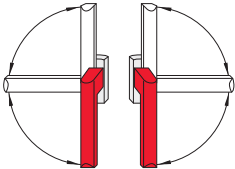
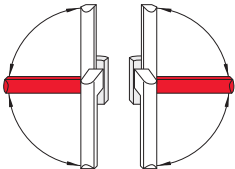
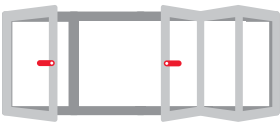
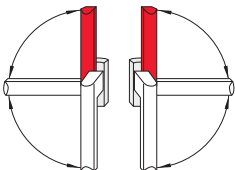


DIAGRAM 871



The following symbols show the different handle positions and the resulting sash positions of windows and balcony doors.

Handle position	Sash position	Symbol	Meaning
			Closed position of the sash
			Turn and fold position of the sash
			Opened tilt position of the sash
			Malpositioning of the sash



Maintenance



WARNING!

Danger of injury through incorrectly conducted maintenance work!

Incorrect maintenance can result in serious personal injury or material damage.

- Before starting work, ensure that there is sufficient installation room.
- Maintain order and cleanliness at the installation location.
- Ensure that the window or balcony door is prevented from suddenly slamming during maintenance work.
- Get a specialist company to carry out adjustment work on hardware – especially of pivot rests and scissor stays – as well as replacement of parts and hinging and unhinging of sashes.
- Do not un hinge the sash for maintenance work.

At least annually, every six months for school and hotel buildings:

	Specialist company	End-users
If necessary, tighten fixing screws.	■	–
Replace damaged screws.	■	–
If necessary, replace components.	■	–
Lubricate all moving components with acid free and non resinous oil from a specialised dealer.	□	□
Lubricate steel strikers with acid free and non resinous grease from a specialised dealer.	□	□

■ = To be carried out **only** by a specialist company.

– = **Not** to be carried out by the end-user; the end-user may not carry out installation work!

□ = To be carried out either by a specialist company or by the end-user.



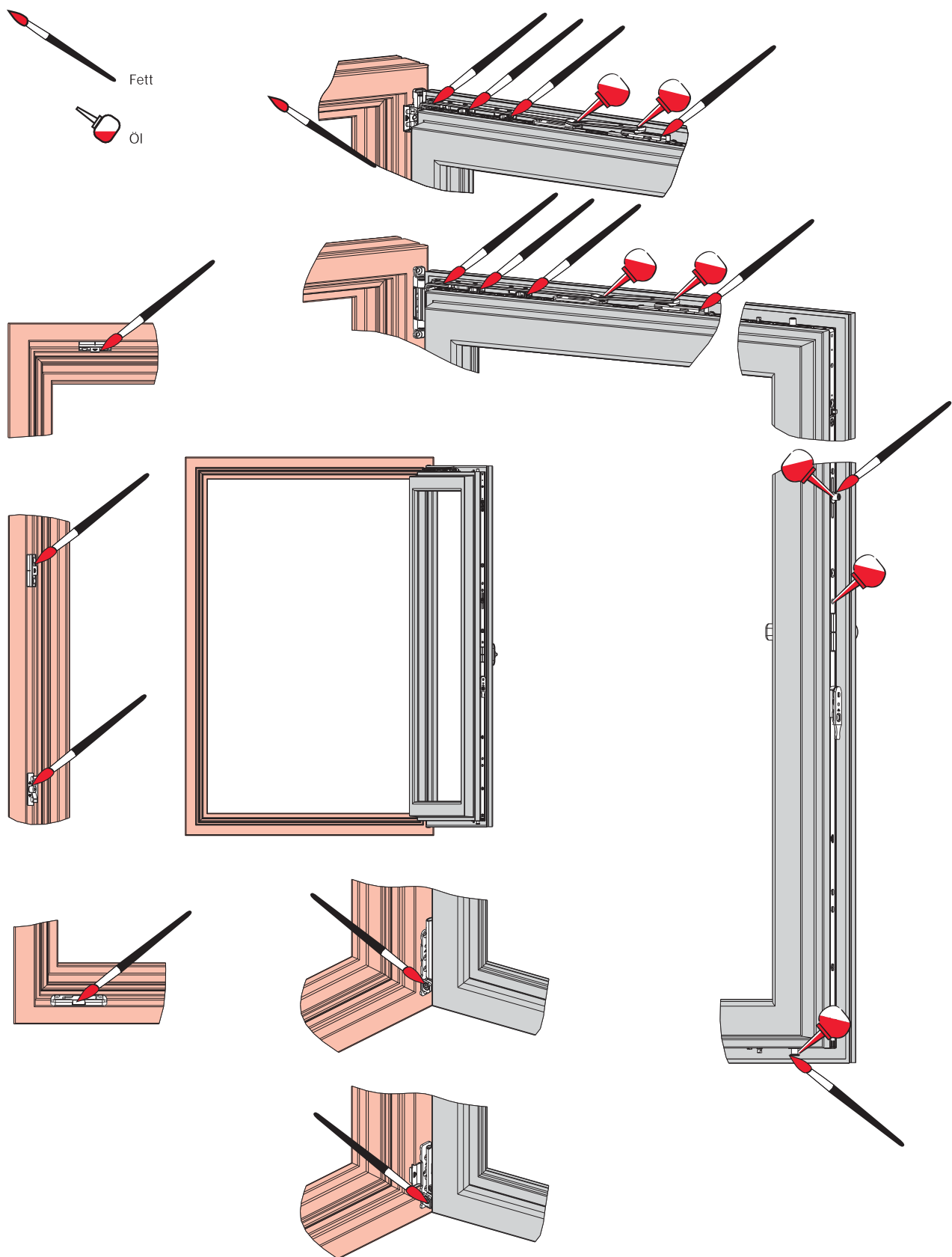
NOTE!

Observe the following environmental protection notes during maintenance work:

- Remove emerging or residual grease at the lubricating points and dispose of in accordance with the valid local regulations.
- Collect exchanged oil in suitable containers and dispose of in accordance with the environmental regulations.

Maintenance

Lubrication points





Inspection

At least annually, every six months for school and hotel buildings:

	Specialist company	End-users
Check that safety-relevant hardware components are mounted securely.	☐	☐
Examine safety-relevant hardware components for wear and tear.	☐	☐
All movable parts are to be operation-tested.	☐	☐
All locking points are to be operation-tested.	☐	☐
The hardware's smooth operation can be checked by means of moving the window handle.		
▪ In accordance with DIN 18055, the locking and unlocking moment is max. 10 Nm.	■	–
▪ It can be checked using a torque wrench.	■	–
▪ The smooth operation can be improved by greasing/oiling or adjusting the hardware.	■	–

■ = To be carried out only by a specialist company

– = **Not** to be carried out by the end-user; the end-user may not carry out installation work!

☐ = To be carried out either by a specialist company or by the end-user.

Care

	Specialist company	End-users
Keep the hardware free from deposits and soiling.	☐	☐
Never use aggressive, acidiferous cleaners or abrasive cleaning agents.	☐	☐
Only use mild, pH-neutral cleaning agents in diluted form.	☐	☐
Only use a soft cloth for cleaning.	☐	☐

■ = To be carried out only by a specialist company

– = **Not** to be carried out by the end-user; the end-user may not carry out installation work!

☐ = To be carried out either by a specialist company or by the end-user.

No legal claims can be derived from these recommendations, the application is to be conveyed for each concrete individual case. The window and balcony door manufacturer must draw builders and end-user's particular attention to these maintenance instructions. Roto Frank AG recommends window fabricators to make maintenance agreements with their end-users.

Protection against corrosion

	Specialist company	End-users
Aggressive vapours (e.g. by means of formic acid or acetic acid, ammonia, amine or ammonia compounds, aldehydes, phenols, chlorine, tannic acid etc.) in the vicinity of the windows must be absolutely avoided.	■	—
Never use acetic-acid or crosslinked acidic sealing compounds or those with the above mentioned contents, since both the direct contact with the sealing compound and its vaporisation can attack the hardware's surface.	■	—
Due to the risk of salt deposits on the hardware, shorter maintenance and lubrication intervals are necessary in coastal areas (every three months).	■	—

■ = To be carried out only by a specialist company

— = **Not** to be carried out by the end-user; the end-user may not carry out installation work!

□ = To be carried out either by a specialist company or by the end-user.

Protection against dirt

	Specialist company	End-users
Remove deposits and dirt from building materials (building dust, plaster, cement, etc.) or similar materials with water before it cures.	□	□
Keep the hardware and the threshold free from deposits and soiling.	□	□
Never use aggressive, acidiferous cleaners or abrasive cleaning agents.	□	□
Only use mild, pH-neutral cleaning agents in diluted form.	□	□
Only use a soft cloth for cleaning.	□	□

■ = To be carried out only by a specialist company

— = **Not** to be carried out by the end-user; the end-user may not carry out installation work!

□ = To be carried out either by a specialist company or by the end-user.



Protection against (permanent) moist interior air

	Specialist company	End-users
Ventilate the hardware and the rebate areas – especially in the construction phase – so that they are neither exposed to direct contact with water nor to formation of condensation water.	☐	☐
Ensure that (permanently) damp spatial air cannot condense in the hinge and rebate areas: - Force ventilate several times each day (open all windows for approx. 15 minutes). - Also ventilate during holidays and absences. - For more complex construction projects, develop a ventilation plan if necessary. If described systematic ventilation is not possible, e.g. because fresh screed must not be traversed, or it cannot take draughts, put the windows into the tilted position and make them airtight by taping on the indoor side. Divert the moisture present in the room air to the outside by means of condensation dryers.	☐	☐

■ = To be carried out only by a specialist company

– = **Not** to be carried out by the end-user; the end-user may not carry out installation work!

□ = To be carried out either by a specialist company or by the end-user.

Protection against damages due to renovation work

	Specialist company	End-users
When applying surface treatments of the windows, exclude all hardware components from this treatment, and thus protect against contamination.	☐	☐
Use only adhesive tapes which do not damage the varnish layers. In the case of doubt, ask the window fabricator.	☐	☐

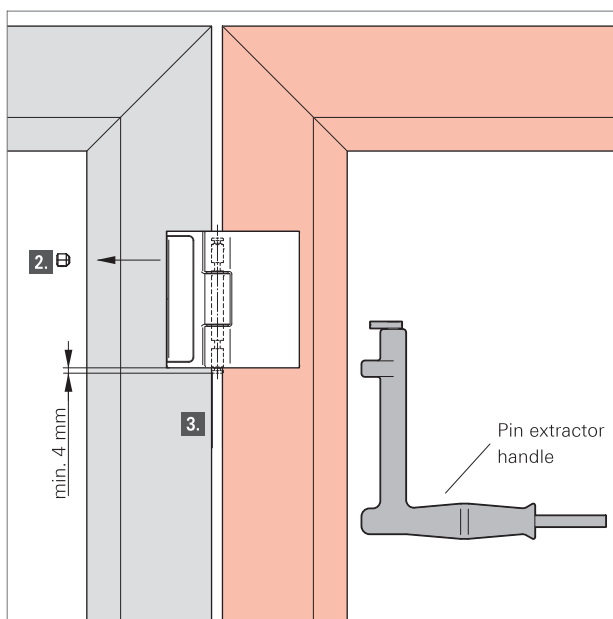
■ = To be carried out only by a specialist company

– = **Not** to be carried out by the end-user; the end-user may not carry out installation work!

□ = To be carried out either by a specialist company or by the end-user.

Dismantling

Unhinging the sash



1. Open the sash/element and secure it from falling out.
2. Remove the bolt (2.5 mm Allen key).
3. Tap out the cylindrical pin min. 4 mm and pull out downwards with the pin extractor handle.
4. Carefully lift out the sash.



Transport / handling of the window elements



DANGER!

Danger to life from incorrect handling and transport!

Incorrect handling and unsuitable transport of window elements can result in dangerous circumstances and cause severe accidents, even including death.

Therefore:

- During loading and unloading, select force application points which exclusively create reaction forces appropriate to the designed layout of the hardware components for the intended installation location.
- During handling and transport, ensure that hardware is in the locked position, so as to prevent an uncontrolled opening of the window. During transport, additionally use suitable means of securing, e.g. tensioning belts.
- Use only transport protections designed for the respective clearance.
- Wherever possible, undertake transport in the intended installation position – transport windows upright and glazed.
- Prevent diagonal moving and slipping of the sash with respect to the frame (e.g. by using spacers).
- If transport in the intended installation position is not possible, unhinge the sash, and transport it separately from the frame to which it belongs.



NOTE!

The type and the force application points when transporting, loading, and unloading have a significant effect on the reaction forces which arise. Especially when using auxiliaries such as suckers, transport nets, forklifts, or cranes, reaction forces may arise which result in damage or overloading to the installed hardware.

Therefore observe the following during all transport, loading, and unloading:

- Always choose the force application points so that the resulting reaction forces are dissipated appropriate to the designed layout of the hardware components for the intended installation location. This applies particularly for the hinge positions.

Check the delivery on receipt immediately for completeness and transport damage.

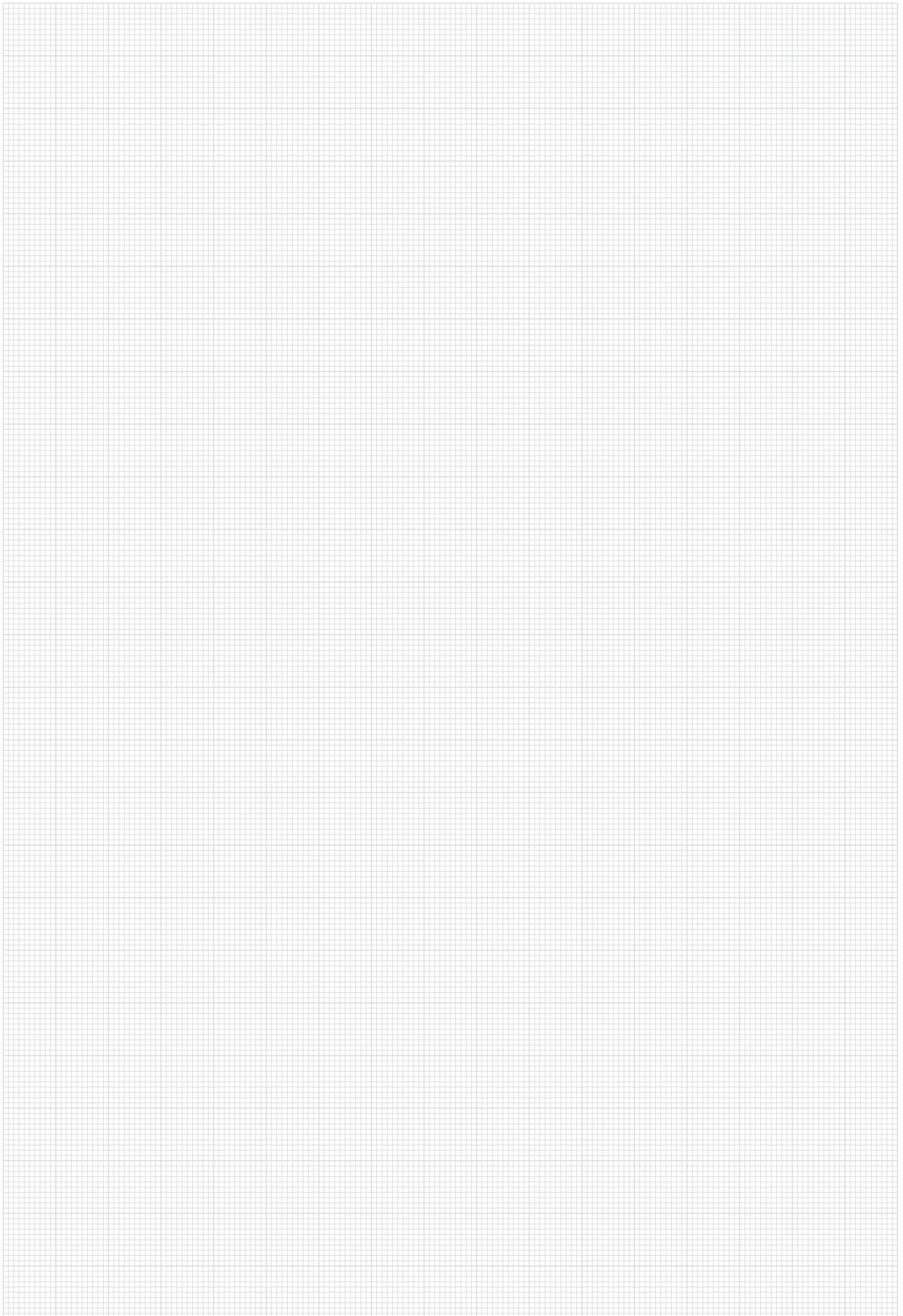


NOTE!

Claim any damage as soon as it is detected. Claims for damage can only be invoked within the statutory reclamation period.



Separate the hardware components from the window and dispose of as metal scrap.



Imprint

Copyright: April 2015

Roto Frank AG
Window and Door Technology

Wilhelm-Frank-Platz 1
70771 Leinfelden-Echterdingen
Germany

Phone +49 711 7598 0
Fax +49 711 7598 253
info@roto-frank.com

www.roto-frank.com

Roto Frank AG
Window and Door Technology

Wilhelm-Frank-Platz 1
70771 Leinfelden-Echterdingen
Germany

Phone +49 711 7598 0
Fax +49 711 7598 253
info@roto-frank.com

www.roto-frank.com



From a single source: Optimum hardware systems to meet all challenges

- Roto Tilt&Turn** | The Tilt&Turn hardware system for windows and balcony doors
- Roto Sliding** | Hardware systems for large sliding windows and doors
- Roto Door** | Matching hardware technology "everything about doors"
- Roto Equipment** | Additional technology for windows and doors