Window and Door Technology

Roto Patio Lift

Standard hardware
for large Lift&Slide doors up to 300 kg

Installation, maintenance and operation instructions
for aluminium profiles

Editorial details
Copyright: May 2013
Roto Frank AG
Wilhelm-Frank-Platz 1
70771 Leinfelden-Echterdingen, Germany
Telephone +49 711 7598 0
Fax +49 7117598 253
info@roto-frank.com
www.roto-frank.com

General information

Information on these instructions **5**
Responsibility of the target groups **6**
Instruction obligation of the target groups **7**
Explanation of the safety instruction symbols **8**
Limitation of liability **9**

Safety

Safety instructions **12**
Safety instructions for end-users **13**
Fabrication advice **14**
Fabrication advice **15**
Screwed connection **16**

Information on the product

General hardware characteristics **18**
Application diagram **20**
Versions **21**

Hardware overview

Explanation for hardware overview chapter **22**
Diagram A – Hardware overview – DIN left **23**
Diagram C – Hardware overview – passive sash **24**
Diagram C – Hardware overview – active sash **25**
Diagram D – Hardware overview – passive sash **26**
Diagram D – Hardware overview – active sash **27**
Jigs **29**

Installation

Sash **32**
Espagnolette selection 32
Drilling and milling handles 33
Installing the bogie assembly 34
Cropping the espagnolette 36
Install the espagnolette 37
Installing the handle 38

Frame **39**
Installing the strikers 39

Frame and sash connection **40**
Hinging the sash 40
Installing the end stop 41

Operation

Operating instructions **42**
Operation instructions for end-users **43**

Maintenance

Lubrication points **47**
Inspection and care **48**
Preservation of the surface finish **49**

Transport

Transport, packaging, storage **51**
Transport inspection **52**

Disposal

..... **53**

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

This manual also contains binding guidelines to ensure that the duty to instruct is observed through to the end-user.

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

In addition to these installation, maintenance and operation instructions, the following documents apply:

- Directive of the Quality Assurance Association: Locks and Hardware (Richtlinie der Gütegemeinschaft Schlösser und Beschläge e. V.)
- VHBE Directive of the Quality Assurance Association: Locks and Hardware (Richtlinie VHBE der Gütegemeinschaft Schlösser und Beschläge e. Association: Locks and Hardware (Richtlinie der Gütegemeinschaft Schlösser und Beschläge e. V.)

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 markings are used in this manual:

Marking	Explanation
	Sash
	Frame
	Drill holes
①	Hardware components
1.	Action steps
■	First level of hierarchy in a list
–	Unordered list (second level of hierarchy)
→ p. 12	(Cross) reference in tables
Refer to page 12	(Cross) reference in the text

Abbreviation	Explanation
SW	Sash width
SH	Sash height
S.KG	Sash weight
B	Backset
HH	Handle height
L	Length

All dimensions stated in mm.

Copyright

The information in this document is aimed at 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 fit it into windows and balcony doors.

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

Builders
The “builders” 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 otherwise stated below, the documents and information may be forwarded, e.g. as printed documents, on a CD-ROM, or over an Internet connection.

Responsibility of the hardware dealer
The hardware dealer must forward the following documents to the window and balcony door manufacturer:
– Catalogue
– Installation, maintenance and operation instructions
– Guidelines/advice on the product and liability (VHBE)
– Guidelines/advice for end-users (VHBE)

Responsibility of the window and balcony door manufacturer
The window and balcony door manufacturer must forward 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
– Guidelines/advice on the product and liability (VHBE)
– Guidelines/advice for end-users (VHBE)

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

Responsibility of the building element dealer/installation company
The building element dealer must forward 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 liability (VHBE)
– Guidelines/advice for end-users (VHBE)

Responsibility of the builder
The builder must forward the following documents to the end-user:
– Maintenance and operating instructions (with the focus on hardware)
– Guidelines/advice for end-users (VHBE)

In this manual, 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 combination of symbol and signal word indicates an imminently hazardous situation that may lead to fatality or serious injuries if not avoided.

WARNING!
This combination of symbol and signal word indicates a potentially hazardous situation that may lead to fatality or serious injuries if not avoided.

CAUTION!
This combination of symbol and signal word indicates a potentially hazardous situation that may lead to minor or light injuries if not avoided.

NOTE!
This symbol and signal word indicate a potentially hazardous situation that may lead to property or environmental damage if not avoided.

All the details and information in this document have been compiled based on the relevant standards and regulations, and state of the art development, along with many years of knowledge and experience.

The hardware manufacturer shall not accept liability for damages resulting from:

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

Claims by third parties against the hardware manufacturer on grounds 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, the building element dealer or the builder shall be transferred accordingly.

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

The warranty covers original Roto components only.

Subject to technical modifications conducted as part of the improvement process for performance characteristics and further development.

Sliding 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 also equipped with rollers that are mainly located on the bottom horizontal plane of the sliding sash.
Sliding hardware is used solely for further processing of vertically installed windows and balcony door sashes made of timber, PVC, aluminium, or steel, and their corresponding material combinations.

NOTE!
Depending on the outside temperature, relative humidity of the ambient air, and the application location of the sliding element, a temporary formation of condensation on the aluminium tracks on the inside may occur. This effect is particularly prominent when the air circulation is hindered, for example due to deep reveals, curtains, unfavourable radiator positioning etc.

Stipulated 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 provided by the profile manufacturer (e.g. PVC or light metal profiles, etc.)
– The valid national laws and directives

Any type of use that goes beyond or differs from the stipulated 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.

On windows or balcony doors with sliding hardware, the window and balcony door sashes can be moved horizontally or vertically by operating a handle.
On special designs, the sashes can also be slid and folded into a package (similar to an accordion – Fold&Slide windows).
When a sash is closed and the hardware is locked, the resistance of a gasket usually needs to be overcome.

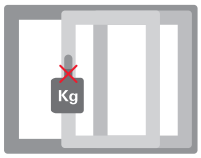
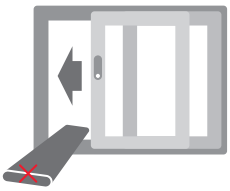
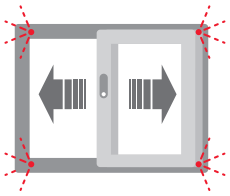
WARNING!
Danger of injury and risk of damage to property through incorrect closing and opening of sashes!
Incorrect closing and opening of sashes can result in severe injuries and significant property damage.
- Ensure that, when opening or closing the sash, it does not collide with the frame or with 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 (buffer) or another sash (technical value – maximum reference speed of the closing edge $v \leq 0.2$ m/s).

Any use beyond or other than the stipulated use and installation of the products is deemed to be misuse, and may lead to hazardous situations.

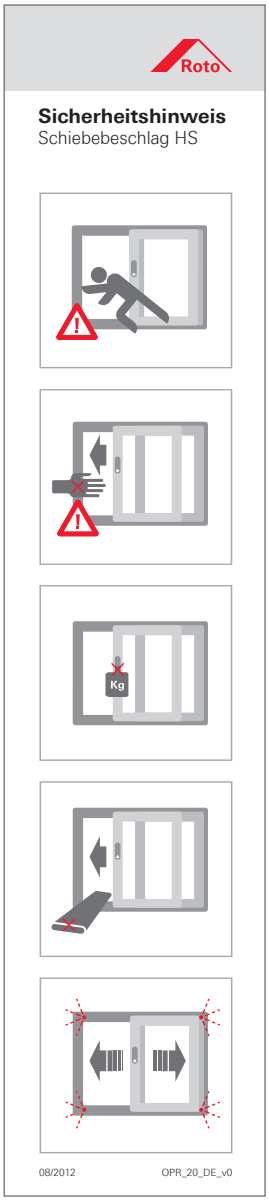
WARNING!
Danger from misuse!
Misuse of windows and balcony doors can lead to hazardous situations.
In particular, avoid the following applications:
- Placing obstacles in the opening area between the frame and the window/balcony door sashes.
- The deliberate or negligent application of additional loads acting on windows and balcony doors.
- The deliberate or uncontrolled slamming or pushing of windows and balcony doors against the window reveal. This can irreparably damage the hardware, frame materials, or other individual window or balcony door components.

No claims shall be accepted for damages of any type whatsoever resulting from operation other than stipulated use.

Always observe the following symbols and their meanings in order to avoid accidents, injuries and property damage.

Symbol	Meaning
	**DANGER!** **Danger of injury from falling through open windows and balcony doors.** – Exercise caution when in the immediate vicinity of open windows and balcony doors. – Keep children and people who are unable to properly assess the danger involved away from the point of danger.
	**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 the sash and frame, and always act with care. – Keep children and people who are unable to properly assess the danger involved away from the point of danger.
	**WARNING!** **Danger of injury and risk of property damage from applying additional force to the sash** – Do not overload the sash.
	**CAUTION!** **Danger of injury and risk of property damage caused by placing objects into the gap between the sash and frame** – Do not place objects into the gap between the sash and the frame.
	**CAUTION!** **Danger of injury and risk of property damage from uncontrolled opening and closing of the 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.

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_20_DE).



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. The component with the smallest permitted load bearing capacity decides the maximum permitted sash weight.

– Check compliance with the technical data, application diagrams, and component classifications before the use of electronic data records, particularly in fenestration programmes.
– The maximum permitted sash sizes and weights must never be exceeded. If in doubt, contact the hardware manufacturer.

The hardware manufacturer is not liable for malfunctions or damage to the hardware or to the windows or balcony-doors equipped with the hardware if any such malfunctions or damage have been caused by inadequate tendering procedures or failure to adhere to the installation instructions and application drawings.

Dimensioning of hardware components

Correct dimensioning of the hardware components can only be guaranteed by carrying out a Roto profile assessment (dimensional control).
Please ask your local Roto sales representative for a profile assessment.

Material selection

Safety and functioning of the hardware components depends on the materials and rail types used.
The window manufacturer has to apply the materials and rail types necessary for safety and correct functioning of the hardware.

Profile overlapping

The window manufacturer must use sufficient sash overlapping to ensure that the sash cannot break out of the window, even if the window or hardware are operated incorrectly.

Profile manufacturer's specifications

The window and balcony door manufacturer must comply with all specified system dimensions (e.g. gasket gap size and lock clearances). Furthermore, the manufacturer must check these dimensions regularly to ensure they are correct, especially on the first use of new hardware components, during manufacture, and as an on-going process up to and including the installation of the windows.

NOTE!
The hardware components should always be designed so that the system dimensions can be adjusted if affected by the hardware. If a deviation from these dimensions is not noticed until after the windows have been installed, the hardware manufacturer shall not be held liable for any additional work required as a result.

Hardware composition
Burglary inhibiting windows and balcony doors require hardware that meets particular specifications.

Windows and balcony doors for damp rooms, and those for use in environments with aggressive and corrosive air content, require hardware that meets particular specifications.

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

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

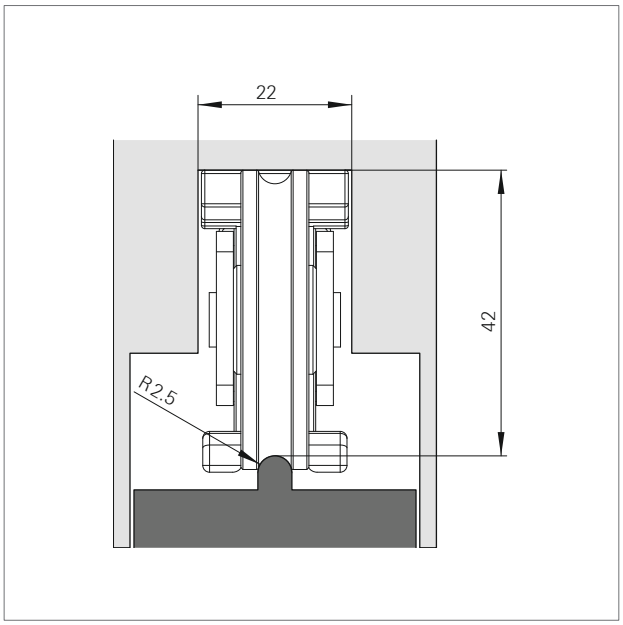
NOTE!
The hardware manufacturer's specifications relating to the combination of the hardware (e.g. the use of additional scissor stay arms, the design of hardware for burglary-inhibiting sashes for windows and balcony doors, etc.) are binding.

DANGER!
Risk of fatal injury from incorrectly installed and bolted-on hardware components
Incorrect installation and improper screwed connection of hardware components can lead to hazardous situations and cause severe or even fatal accidents.
Therefore:
– Observe the product-specific documentation and the manufacturer's information along with the details from the profile manufacturer when installing and, in particular, when making screwed connections.
– The window fabricator must ensure adequate fixing of the hardware components and correct load transfer.

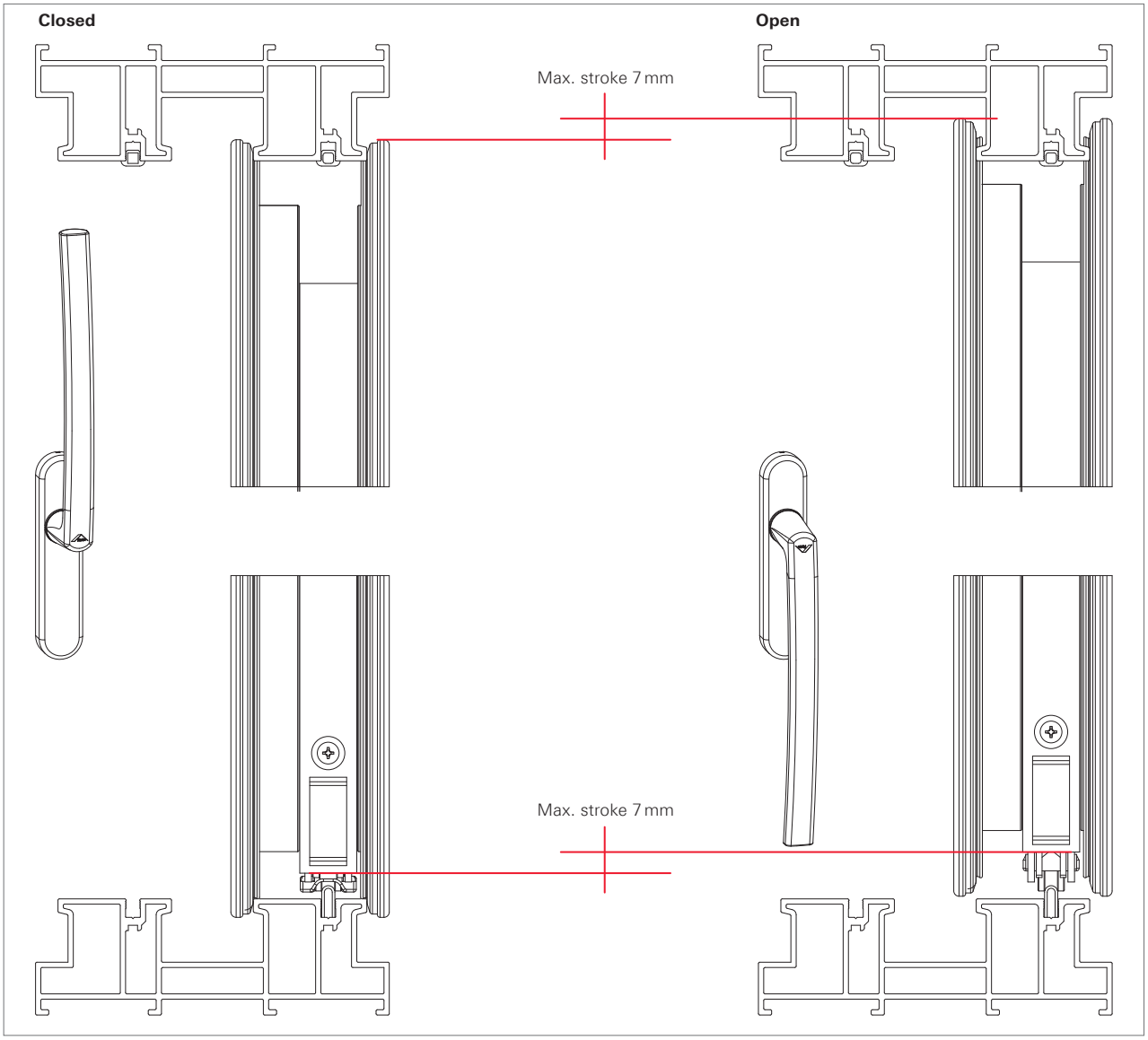
General hardware characteristics

– Sash width: 720 mm – 3000 mm
– Sash height: SRH 1000 mm – 3000 mm
– Sash weight: max. 300 kg

– Functions: Lifting, sliding, lowering, locking
– Diagram A, C, D, G, K
– Convenient operation due to functional components that are precisely tailored to each other
– Quiet running and outstandingly smooth operation thanks to high-quality bogie technology:
  – Ball-bearing rollers
  – Low-noise bogies with high-quality PVC rollers
– Durability due to the use of extremely robust materials
  – Top-quality PVC rollers
  – Stainless steel bogie housings
– Espagnolettes designed for profile cylinders as standard
– Handles in attractive RotoLine design available in the colours white, black, silver and raw (for individual coating).
– Optional locking components allow night ventilation
– Accessories: Info clip for individual branding

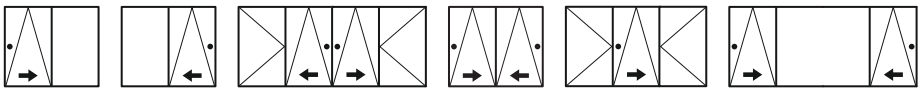


Requirements for groove width and bogie height when closed.



Application diagram

Patio Lift sliding system
Up to 300 kg

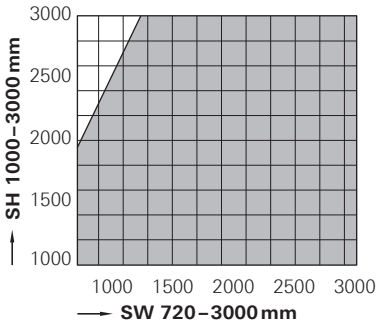


Limitation of sash formats depending on the glass thickness

Application range

Sash width **SW** ..... 720 – 3000 mm
Sash height **SH** ..... 1000 – 3000 mm
Frame external width **FEW** ..... max. 6000 mm
Sash weight **S.kg** ..... max. 300 kg

SH: SW = max. 2.5: 1



= Impermissible application range

Diagram A

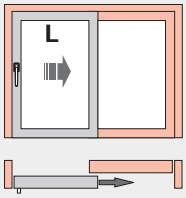


Diagram A, DIN left

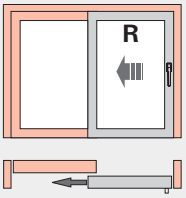


Diagram A, DIN right

Diagram C

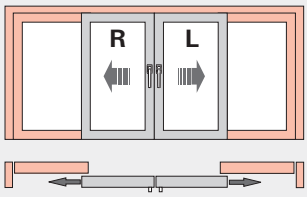


Diagram C

Diagram D

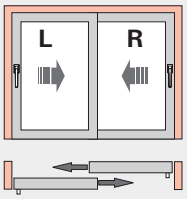


Diagram D

Diagram G

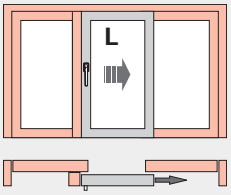


Diagram G2

Diagram K

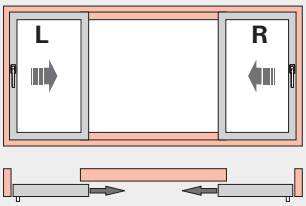
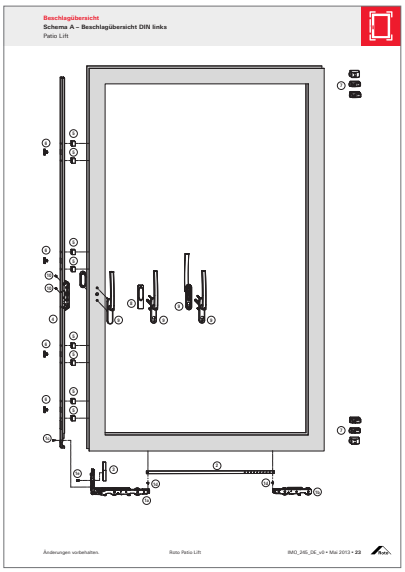


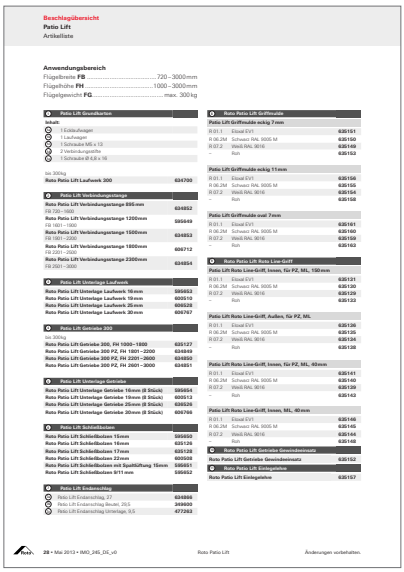
Diagram K

Explanation for hardware overview chapter

The hardware overviews on the following pages are recommendations from Roto Frank AG.

The hardware overview chapter shows the individual hardware components on the left page and the corresponding parts list on the right.
Item numbers in circles allow you to match hardware in the overview with the parts list.





The ordered hardware configuration determines the actual scope of delivery - taking the height and width of the window into account; handles have to be ordered separately.

Diagram A – Hardware overview – DIN left

Patio Lift

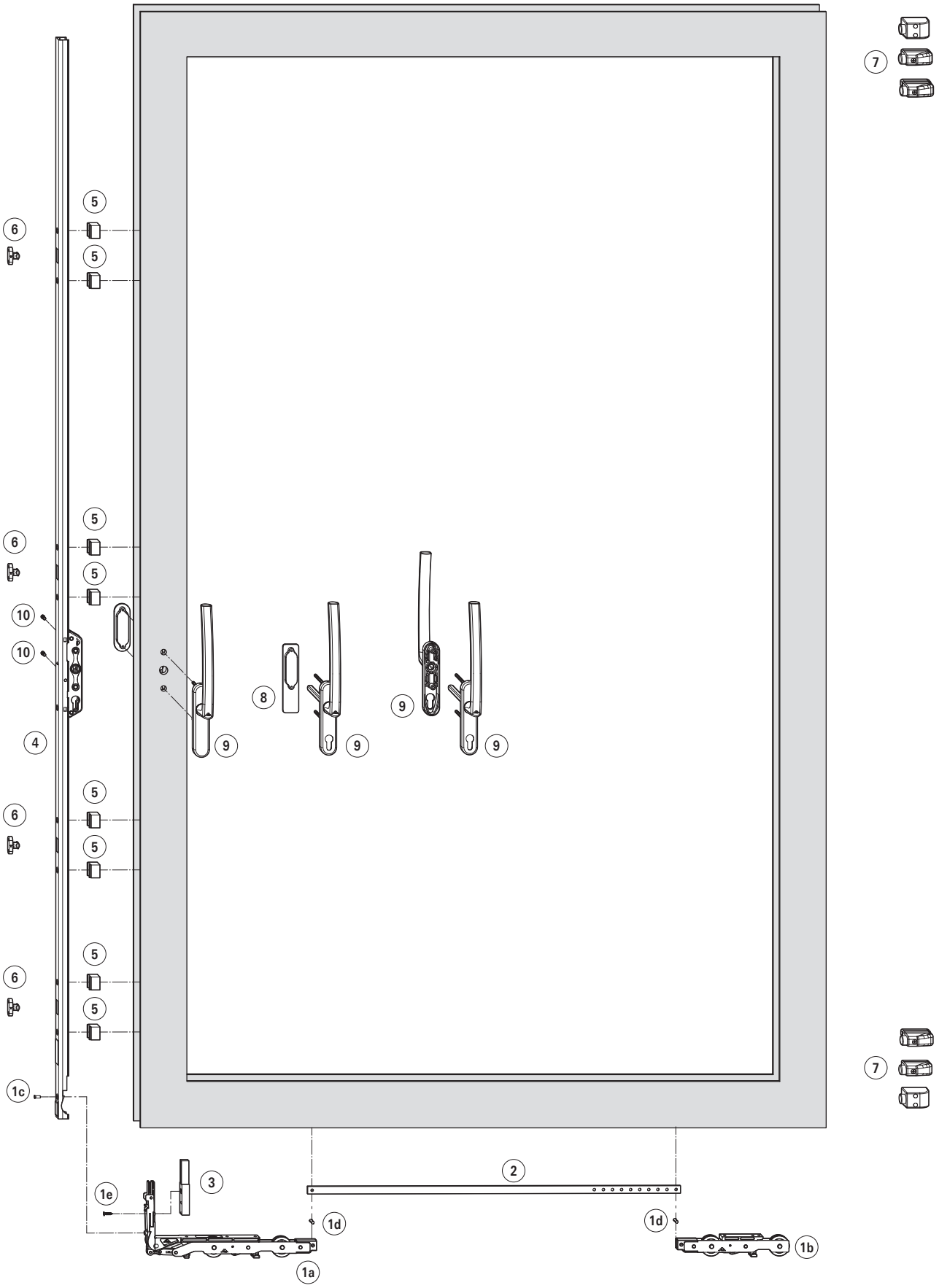


Diagram C – Hardware overview – passive sash

Patio Lift

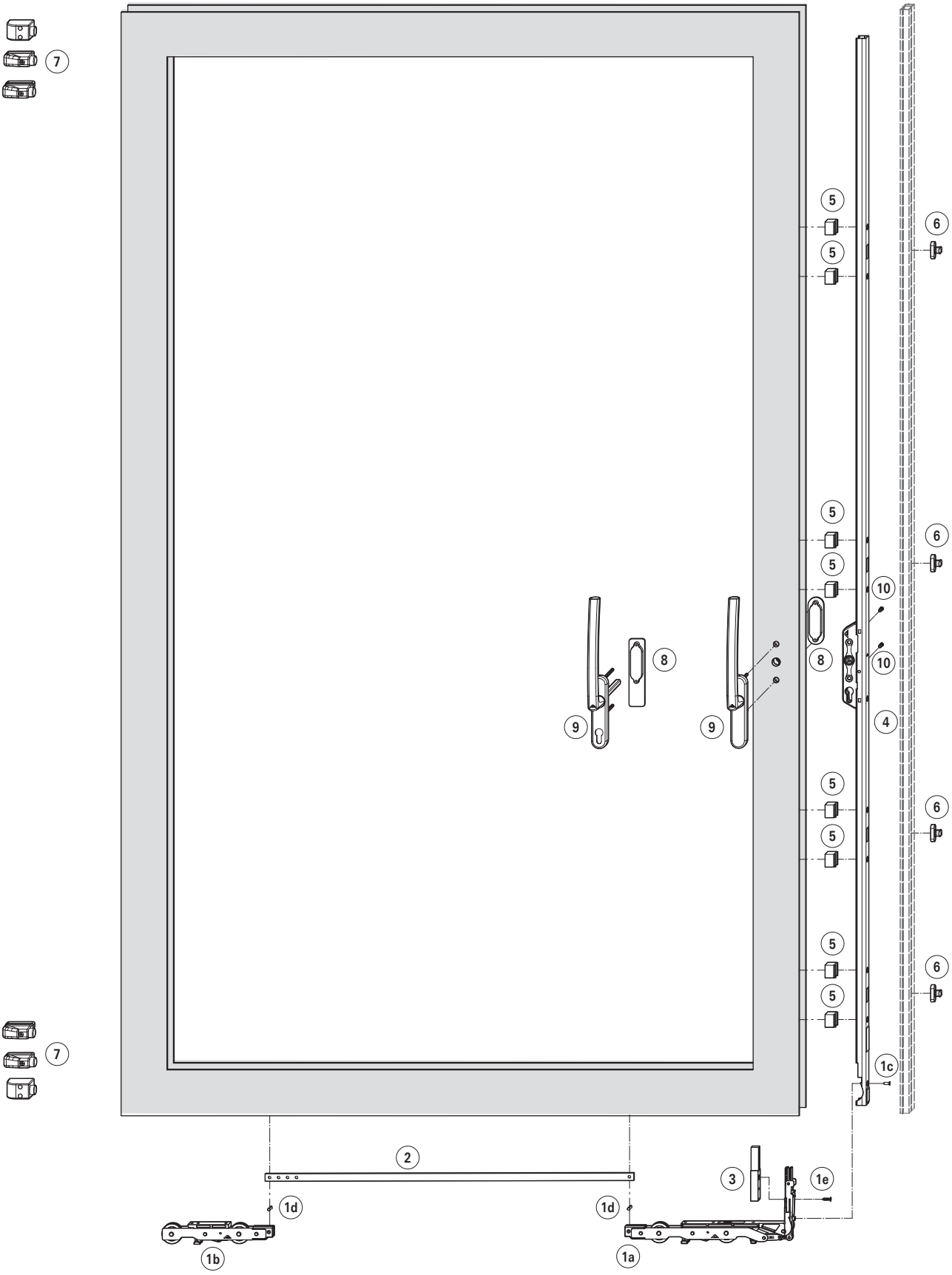


Diagram C – Hardware overview – active sash

Patio Lift

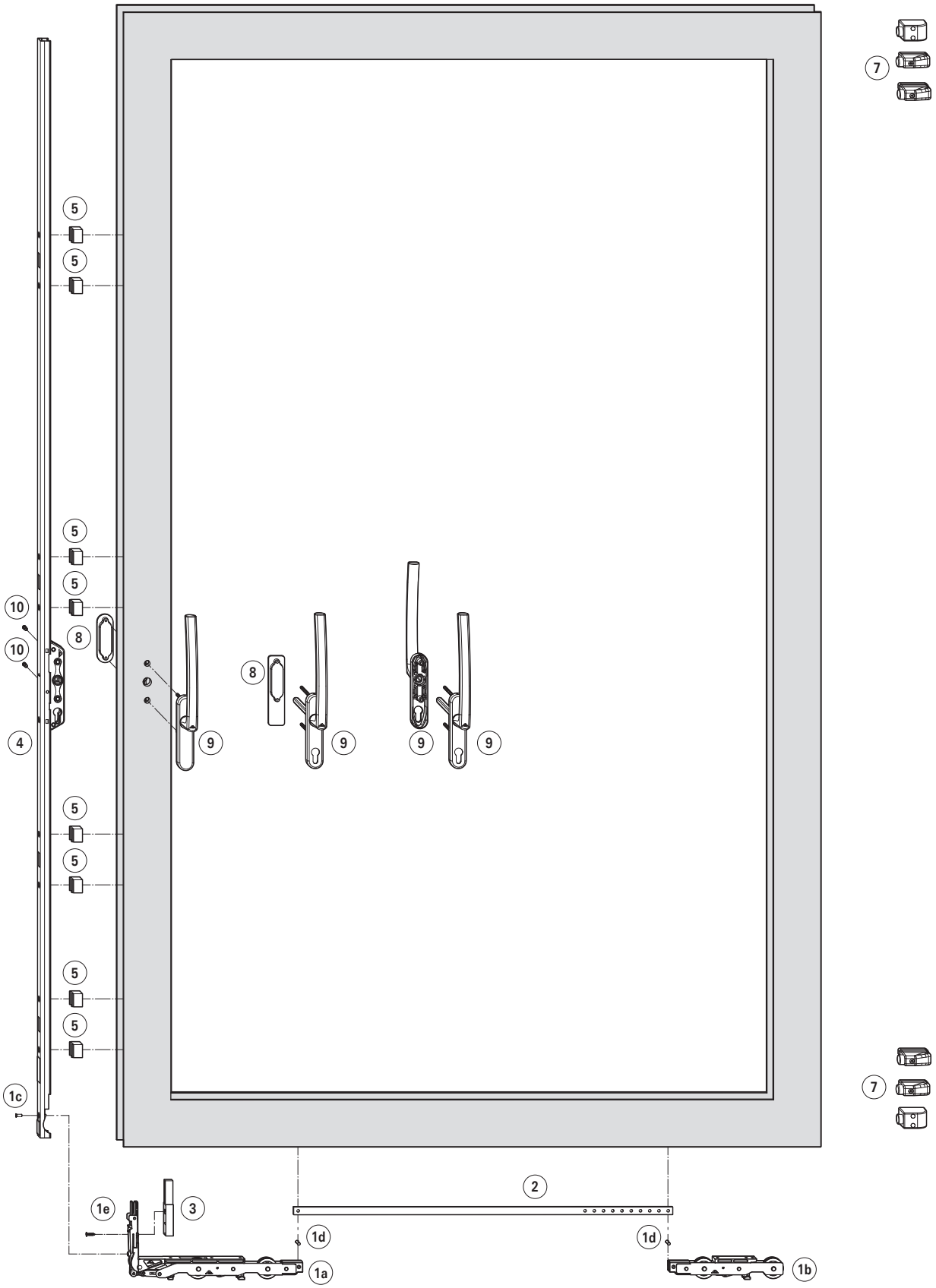
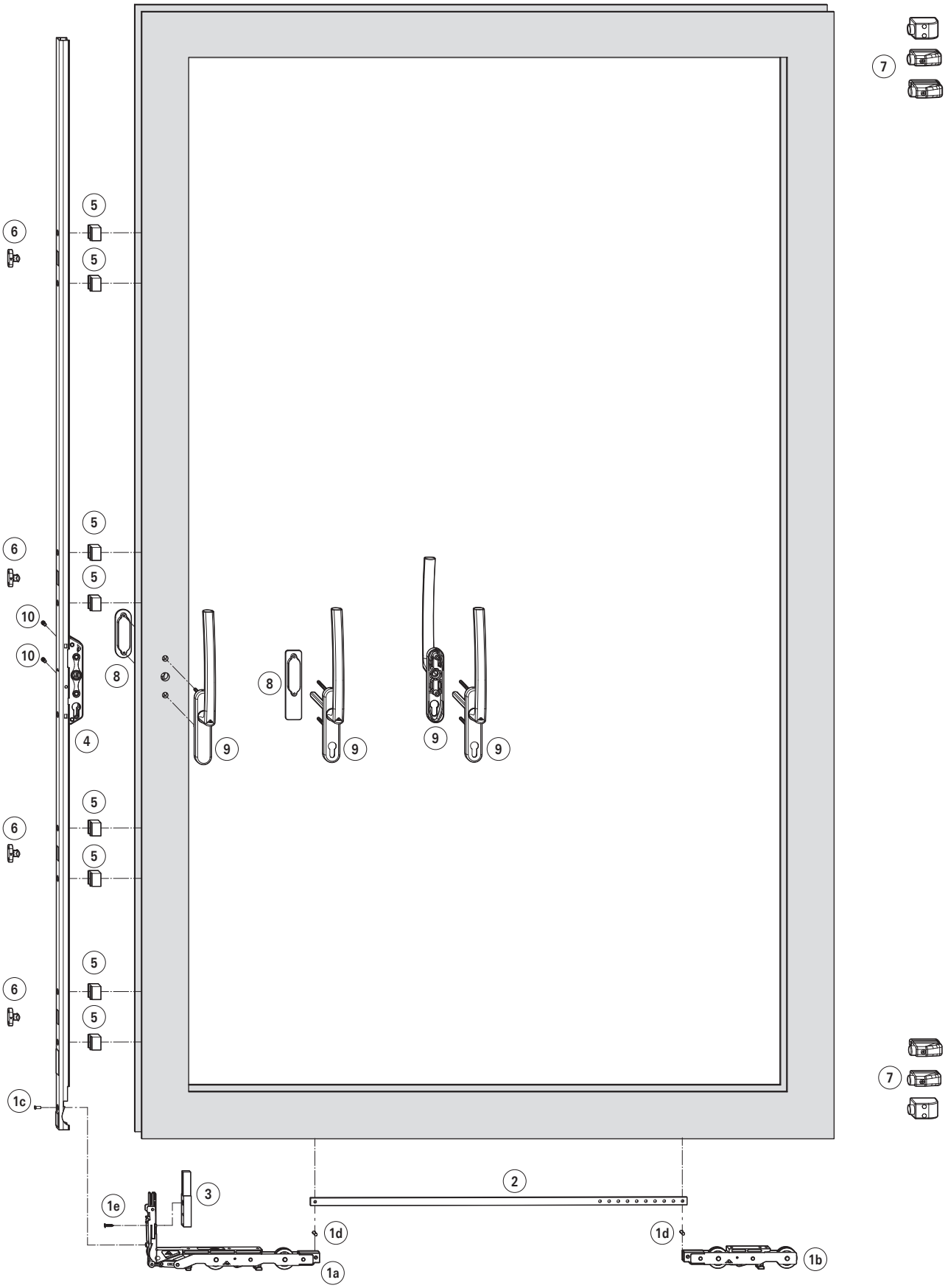
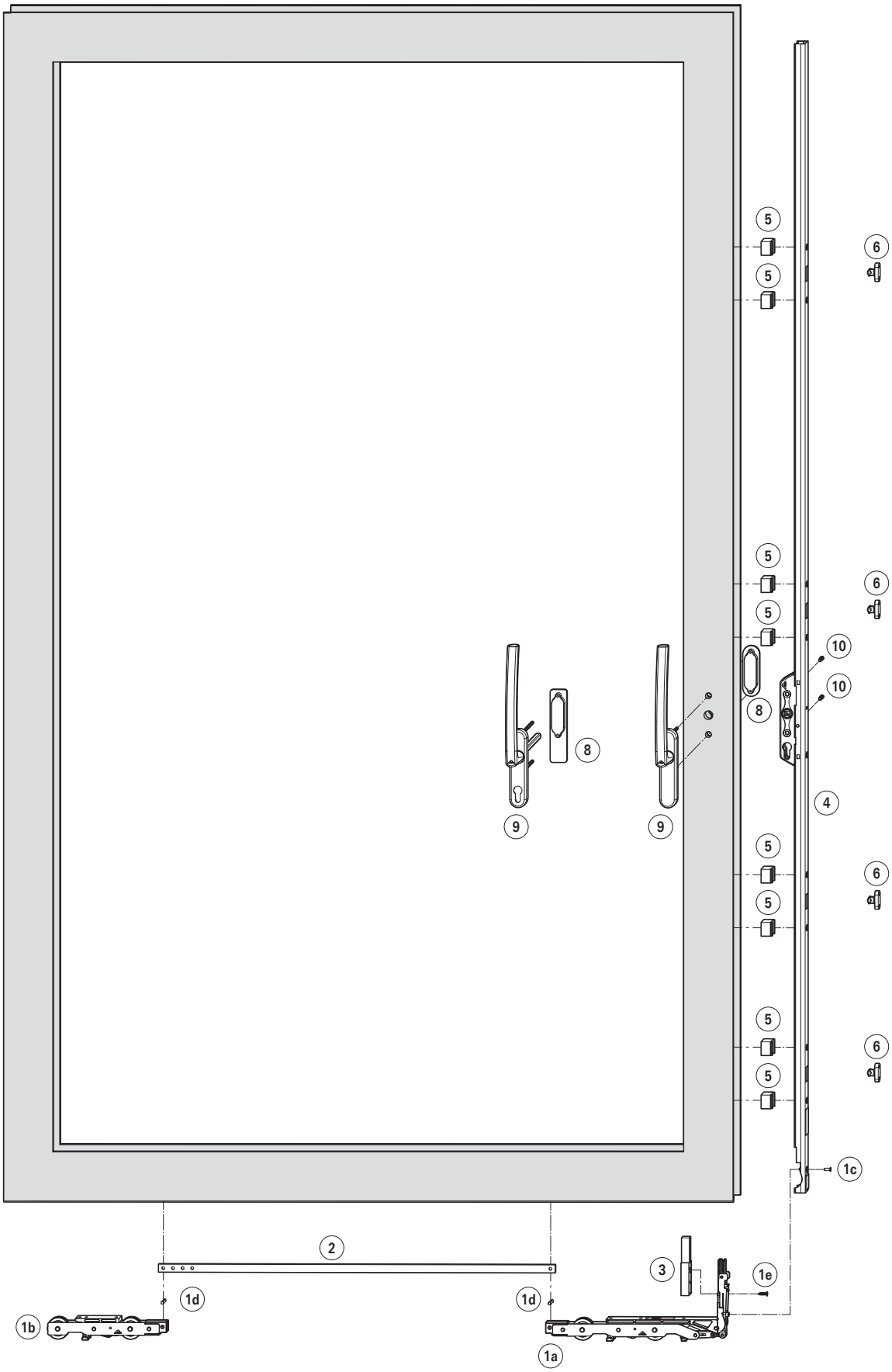


Diagram D – Hardware overview – passive sash

Patio Lift




5
6
5
5
6
10
10
8
8
9
9
4
5
6
5
5
6
1c
2
3
1e
1d
1d
1b
1a

Application range

Sash width **SW** ..... 720 – 3000 mm
Sash height **SH** ..... 1000 – 3000 mm
Sash weight **S.kg** ..... max. 300 kg

① Patio Lift basic carton

Contents:

1a	1 corner bogie
1b	1 bogie
1c	1 screw, M5 x 13
1d	2 connecting pins
1e	1 screw Ø 4.8 x 16 mm

Up to 300 kg

Roto Patio Lift Bogie 300	**634700**

② Patio Lift connecting rod

Roto Patio Lift Connecting rod 895 mm SW 720 – 1600	**634852**
Roto Patio Lift Connecting rod 1200 mm SW 1601 – 1900	**595649**
Roto Patio Lift Connecting rod 1500 mm SW 1901 – 2200	**634853**
Roto Patio LiftConnecting rod 1800 mm FB 2201 –2500	**606712**
Roto Patio Lift Connecting rod 2300 mm FB 2501 –3000	**634854**

③ Patio Lift bogie packer

Roto Patio LiftBogie packer 16 mm	**595653**
Roto Patio LiftBogie packer 19 mm	**600510**
Roto Patio LiftBogie packer 25 mm	**636528**
Roto Patio LiftBogie packer 30 mm	**606767**

④ Patio Lift espagnolette 300

Up to 300 kg

Roto Patio Lift Espagnolette 300, SH 1000 – 1800	**635127**
Roto Patio Lift Espagnolette 300 PC, SH 1801 – 2200	**634849**
Roto Patio Lift Espagnolette 300 PC, SH 2201 – 2600	**634850**
Roto Patio Lift Espagnolette 300 PC, SH 2601 – 3000	**634851**

⑤ Patio Lift espagnolette packer

Roto Patio LiftEspagnolette packer 16 mm (x 8)	**595654**
Roto Patio LiftEspagnolette packer 19 mm (x 8)	**600513**
Roto Patio LiftEspagnolette packer 25 mm (x 8)	**636526**
Roto Patio LiftEspagnolette packer 30 mm (x 8)	**606766**

⑥ Patio Lift locking pin

Roto Patio LiftLocking pin 15 mm	**595650**
Roto Patio LiftLocking pin 16 mm	**635126**
Roto Patio LiftLocking pin 17 mm	**635128**
Roto Patio LiftLocking pin 22 mm	**600508**
Roto Patio LiftLocking pin with night ventilation 15 mm	**595651**
Roto Patio LiftLocking pin 9/11 mm	**595652**

⑦ Patio Lift end stop

7a	Patio Lift end stop, 27	**634866**
7b	Patio Lift end stop bag, 29.5	**349600**
7c	Patio Lift end stop packer, 9.5	**477263**

⑧ Roto Patio Lift Recessed grip

Patio Lift recessed grip, angular, 7 mm

R 01.1	Eloxal EV1	**635151**
R 06.2M	Black, RAL 9005 M	**635150**
R 07.2	White, RAL 9016	**635149**
–	Raw	**635153**

Patio Lift recessed grip, angular, 11 mm

R 01.1	Eloxal EV1	**635156**
R 06.2M	Black, RAL 9005 M	**635155**
R 07.2	White, RAL 9016	**635154**
–	Raw	**635158**

Patio Lift recessed grip, oval, 7 mm

R 01.1	Eloxal EV1	**635161**
R 06.2M	Black, RAL 9005 M	**635160**
R 07.2	White, RAL 9016	**635159**
–	Raw	**635163**

⑨ Roto Patio Lift Roto Line handle

Patio Lift Roto Line handle, interior, for PC, WL, 40 mm

R 01.1	Eloxal EV1	**635141**
R 06.2M	Black, RAL 9005 M	**635140**
R 07.2	White, RAL 9016	**635139**
–	Raw	**635143**

Patio Lift Roto Line handle, interior, WL, 40 mm

R 01.1	Eloxal EV1	**635146**
R 06.2M	Black, RAL 9005 M	**635145**
R 07.2	White, RAL 9016	**635144**
–	Raw	**635148**

Patio Lift Roto Line handle, interior, for PC, WL, 150 mm

R 01.1	Eloxal EV1	**635131**
R 06.2M	Black, RAL 9005 M	**635130**
R 07.2	White, RAL 9016	**635129**
–	Raw	**635133**

Patio Lift Roto Line handle, exterior, for PC, WL

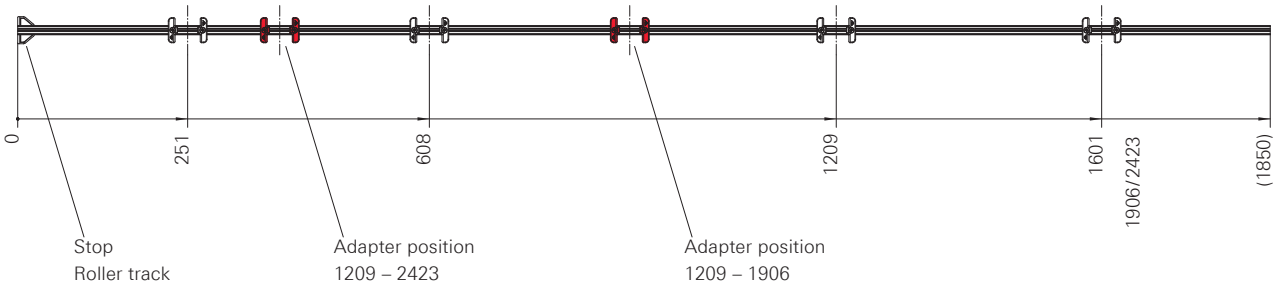
R 01.1	Eloxal EV1	**635136**
R 06.2M	Black, RAL 9005 M	**635135**
R 07.2	White, RAL 9016	**635134**
–	Raw	**635138**

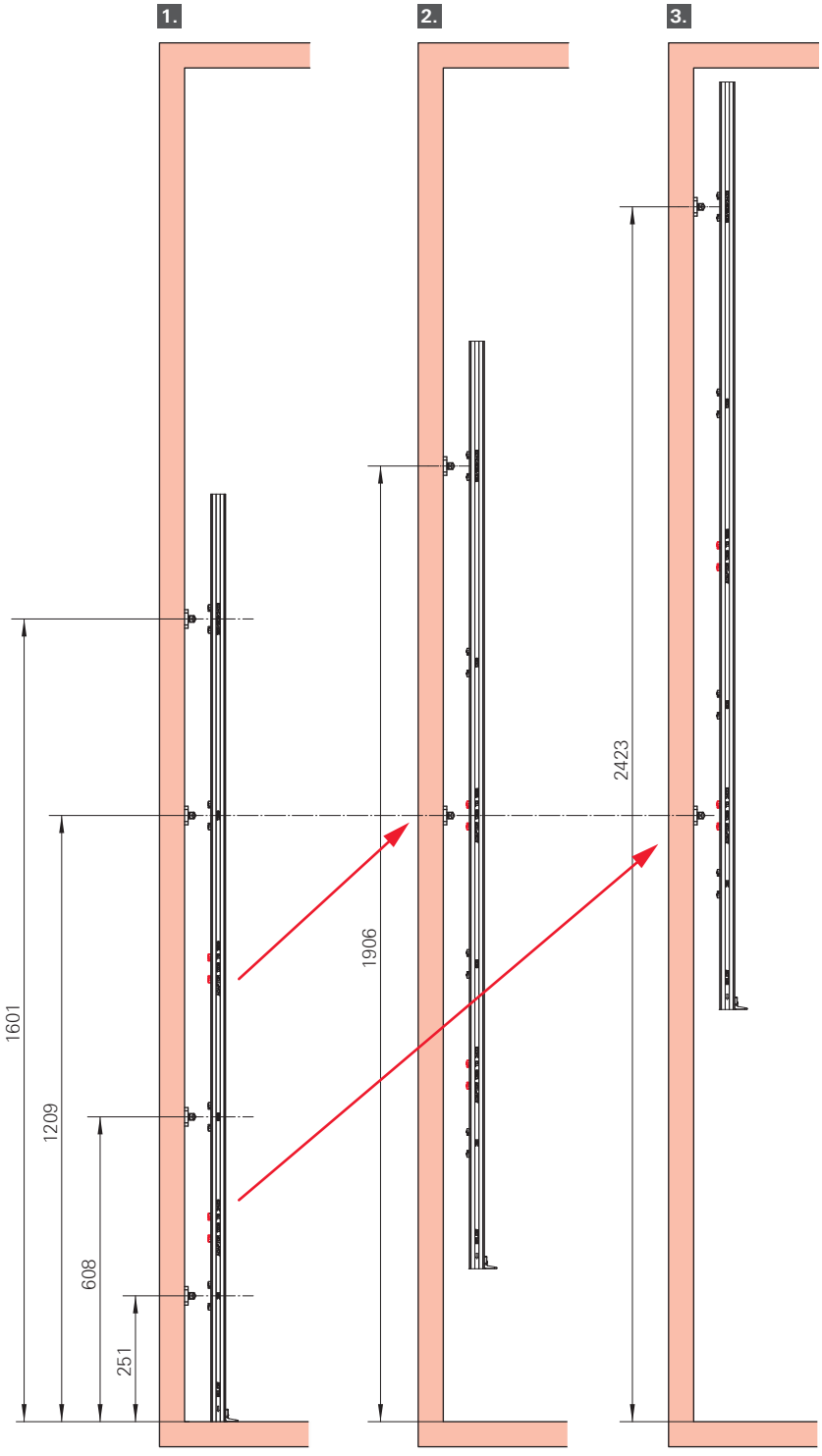
⑩ Roto Patio Lift Espagnolette threaded insert

Roto Patio Lift Espagnolette threaded insert	**635152**

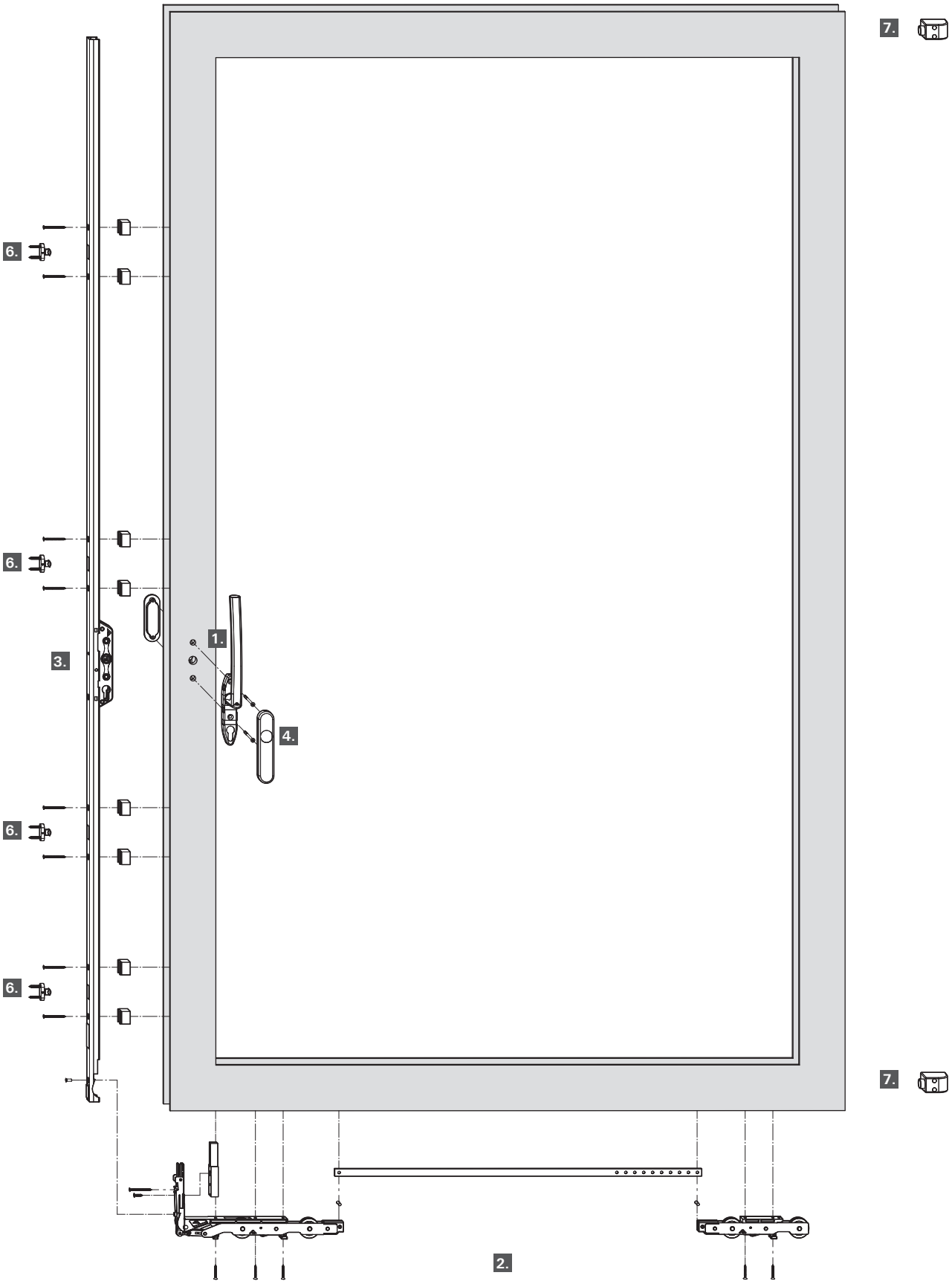
⑪ Roto Patio LiftStriker positioning jig

Roto Patio LiftStriker positioning jig	**635157**

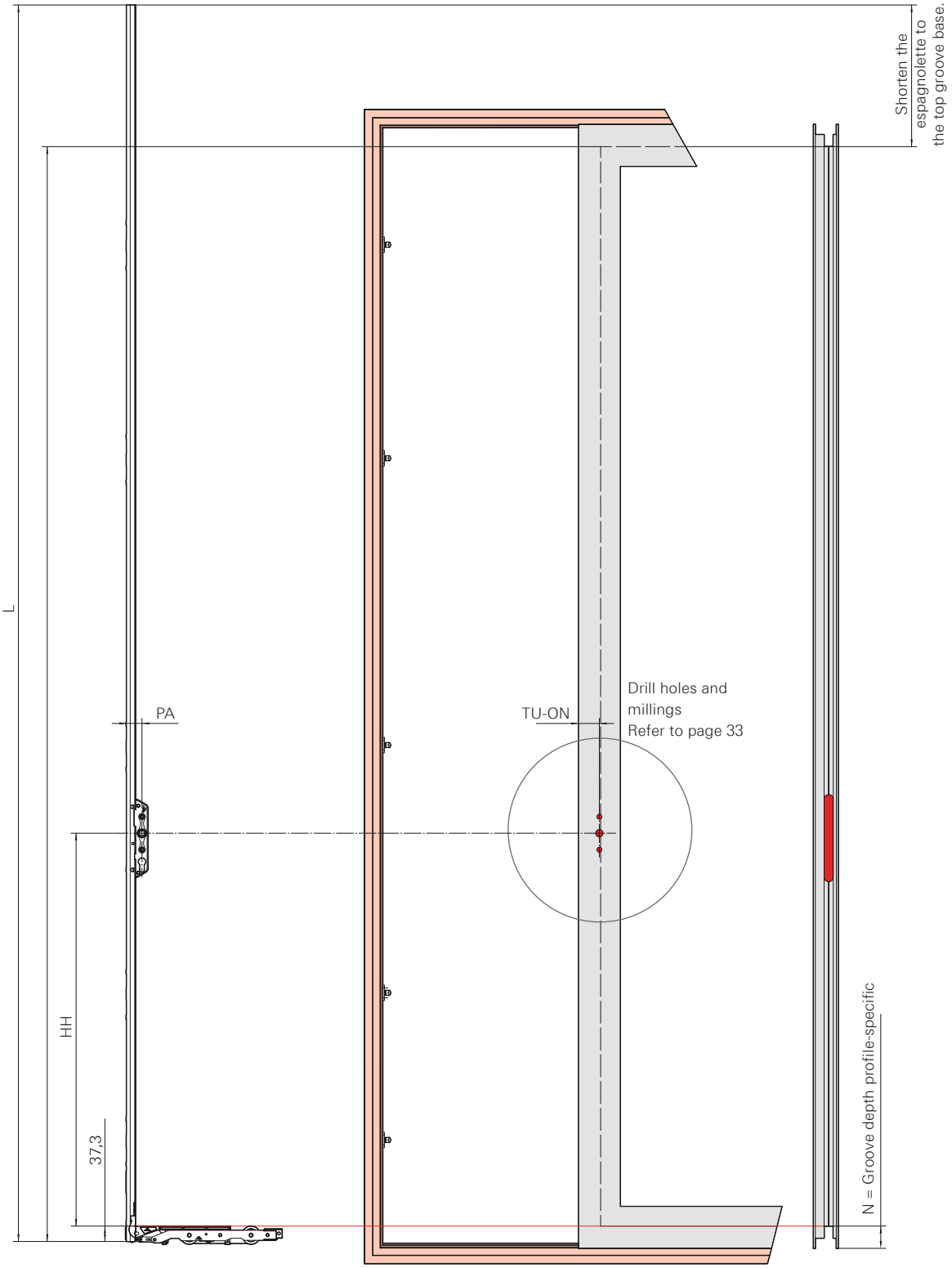




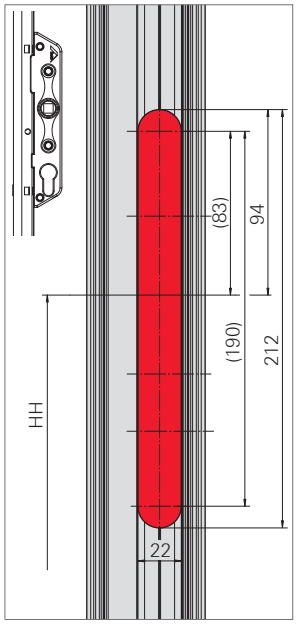
1. Set striker positions 251, 608, 1209.
2. For striker position 1906, set the jig to adapter position 1209 and the striker to position 1906.
3. For striker position 2423, set the jig to adapter position 1209 and the striker to position 2423.

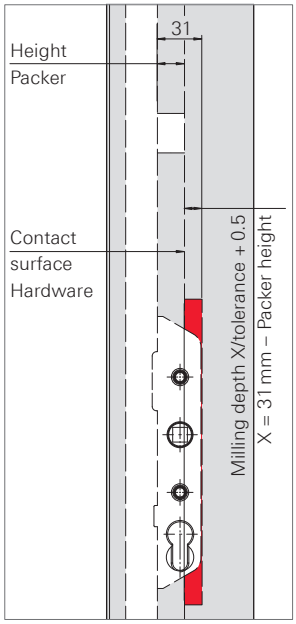

7.
6.
6.
3.
1.
4.
6.
6.
7.
2.

Component	Installation procedure	Aid	Page
1. **Sash fabrication – handle**	Mill out the espagnolette groove.		33
	Drill holes in the handle.		33
	Mill out the recessed grip groove.		33
2. **Bogie**	Cut the connecting rod to length.		34
	Bolt the corner bogie to the packer.		34
	Mount the connecting rod with bogie.		35
	Install the bogie assembly.		35
3. **Espagnolette**	Crop the espagnolette.		36
	Break the caps out of the espagnolette.	Suitable tool.	37
	Mount the packers on the espagnolette.		37
	Before installation, move the espagnolette into the closed position.		37
	Place the espagnolette on the bogie, making sure that the connecting rod of the espagnolette latches into the groove of the bogie mechanism. Tighten the screw.		37
	Tighten all the espagnolette screw fittings.		37
4. **Handle**	Crop the handle screws to length. Install the handle.		38
6. **Strikers**	Install.		39
5. **Sash**	Hinge the sash (not shown).		40
7. **End stop**	Install.		41

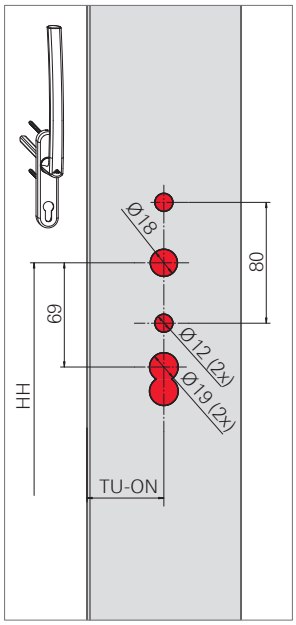


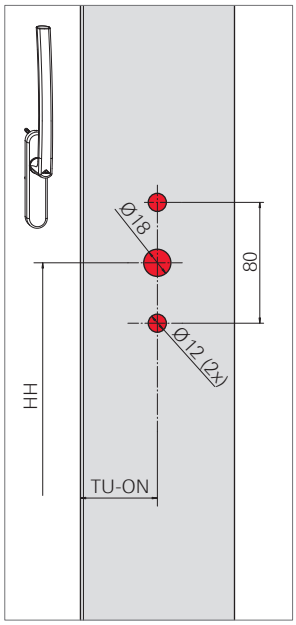
Patio Lift espagnolette		Sash height SH (mm)	Weight	Backset B (mm): 37.5			
				Espagnolette length L (mm)	Handle height HH (mm)		
Patio Lift espagnolette 300 PC	SH 1000 – 1800	1000 – 1800	300 kg	1700	349	6	3
Patio Lift espagnolette 300 PC	SH 1801 – 2200	1801 – 2200	300 kg	2185	953	8	4
Patio Lift espagnolette 300 PC	SH 2201 – 2600	2201 – 2600	300 kg	2375	953	8	4
Patio Lift espagnolette 300 PC	SH 2601 – 3000	2601 – 3100	300 kg	3000	953	10	5
Patio Lift espagnolette 300	SH 1801 – 2200	1801 – 2200	300 kg	2185	953	8	4
Patio Lift espagnolette 300	SH 2201 – 2600	2201 – 2600	300 kg	2375	953	8	4
Patio Lift espagnolette 300	SH 2601 – 3000	2601 – 3100	300 kg	3000	953	10	5



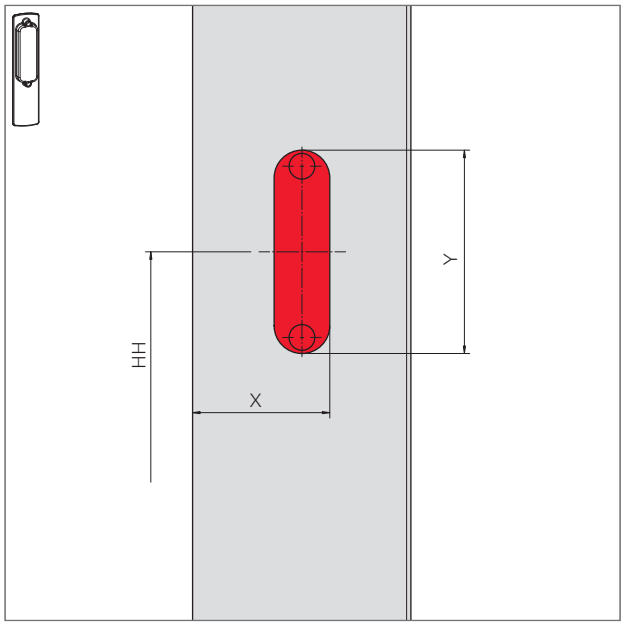


1. Mill out the espagnolette groove.





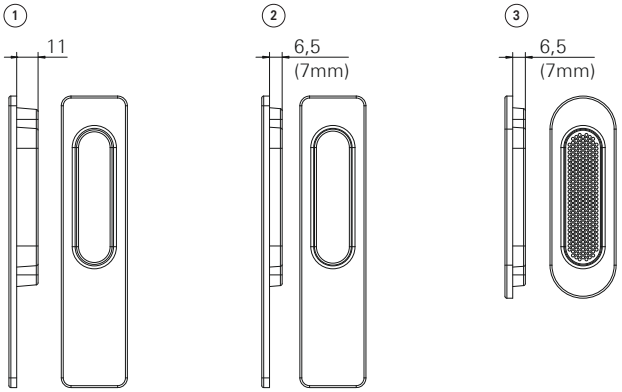
2. Drill holes in the handle.
TU-ON = backset sash; profile-specific; drawing on request

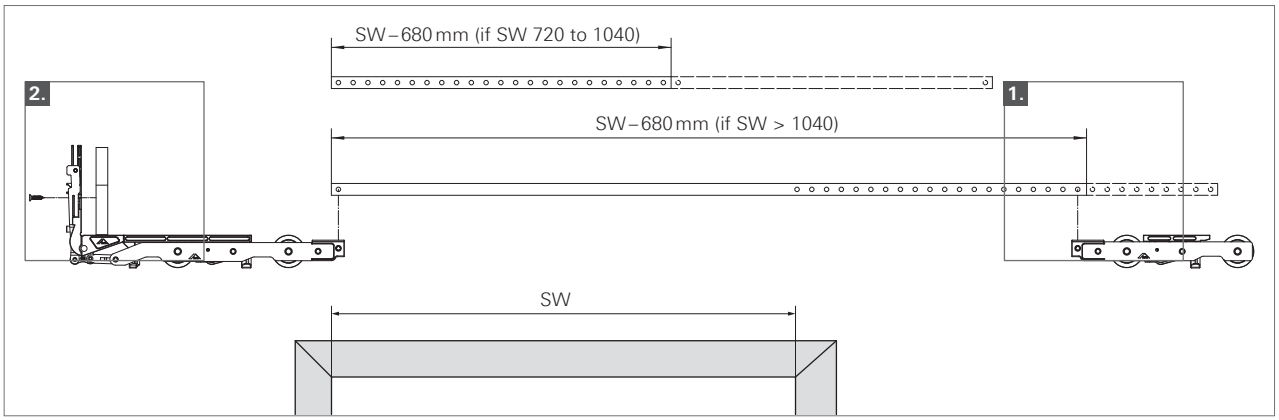


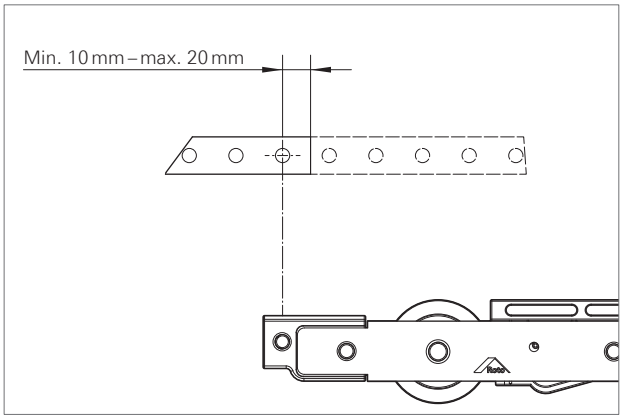
3. Mill out the recessed grip groove.

Recessed grip groove

	Designation	X	Y	Milling depth
①	Patio Lift recessed grip, angular, 11 mm	28	93	**11**
②	Patio Lift recessed grip, angular, 7 mm	28	93	**7**
③	Patio Lift recessed grip, oval, 7 mm	26	96	**7**





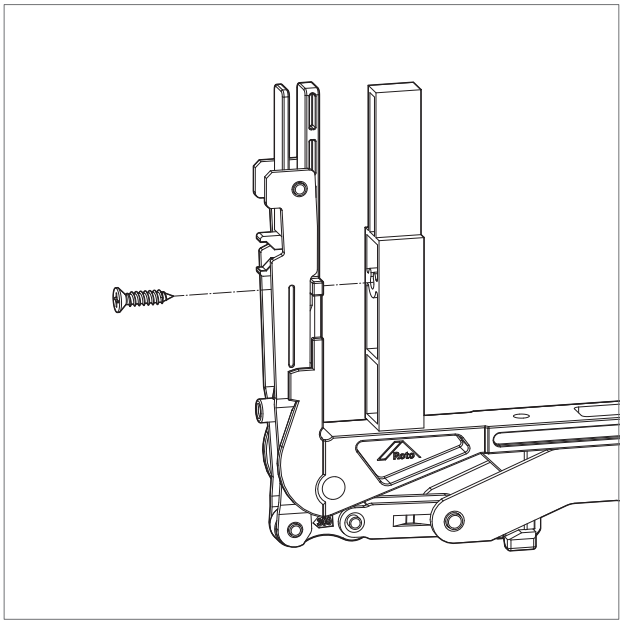


1. Cut the connecting rod to length.
Overhang after cut from centre of drill hole -pin:
min: 10 mm – max. 20 mm

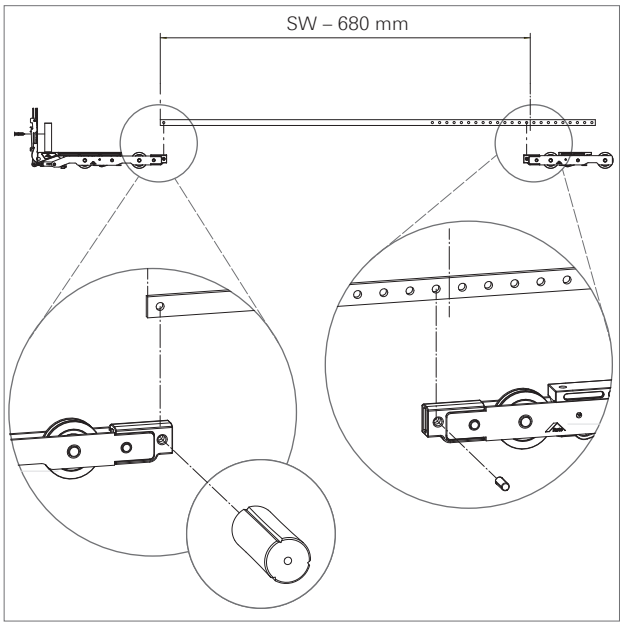
NOTE!
For SW 720 to 1040 mm, the connecting rod must be cut off from the opposite side.
The connecting rod can be shorter by a hole distance (20 mm) each way.

Patio Lift connecting rods

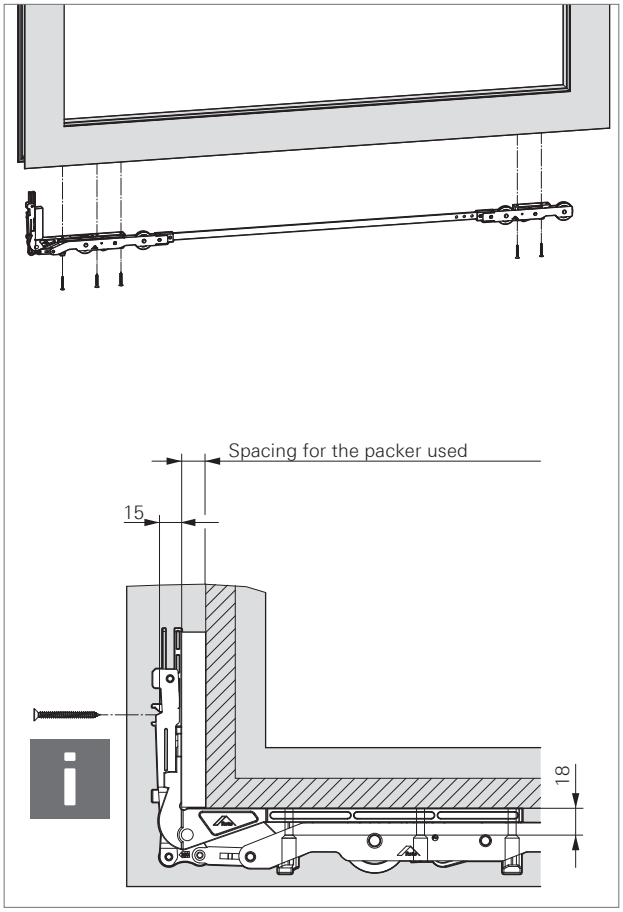
Designation	Sash width (SW)	Length
Patio Lift connecting rod 895 mm 150 SW 620 – 1500/300 SW 720 – 1600	700 – 1600	**895**
Patio Lift connecting rod 1200 mm 150 SW 1501 – 1800/300 SW 1601 – 1900	1601 – 1900	**1200**
Patio Lift connecting rod 1500 mm SW 1801 – 2100/300 SW 1901 – 2200	1901 – 2200	**1500**
Patio Lift connecting rod 1800 mm SW 2101 – 2400/300 SW 2201 – 2500	2201 – 2500	**1800**
Patio Lift connecting rod 2200 mm SW 2401 – 2800/300 SW 2501 – 3000	2501 – 3000	**2200**



2. Bolt the corner bogie to the packer.
Screw Ø 4.8 x 20 from basic carton.



3. Insert the connecting rod in the bogie.
Observe the markings on the pins; knock the pins in.

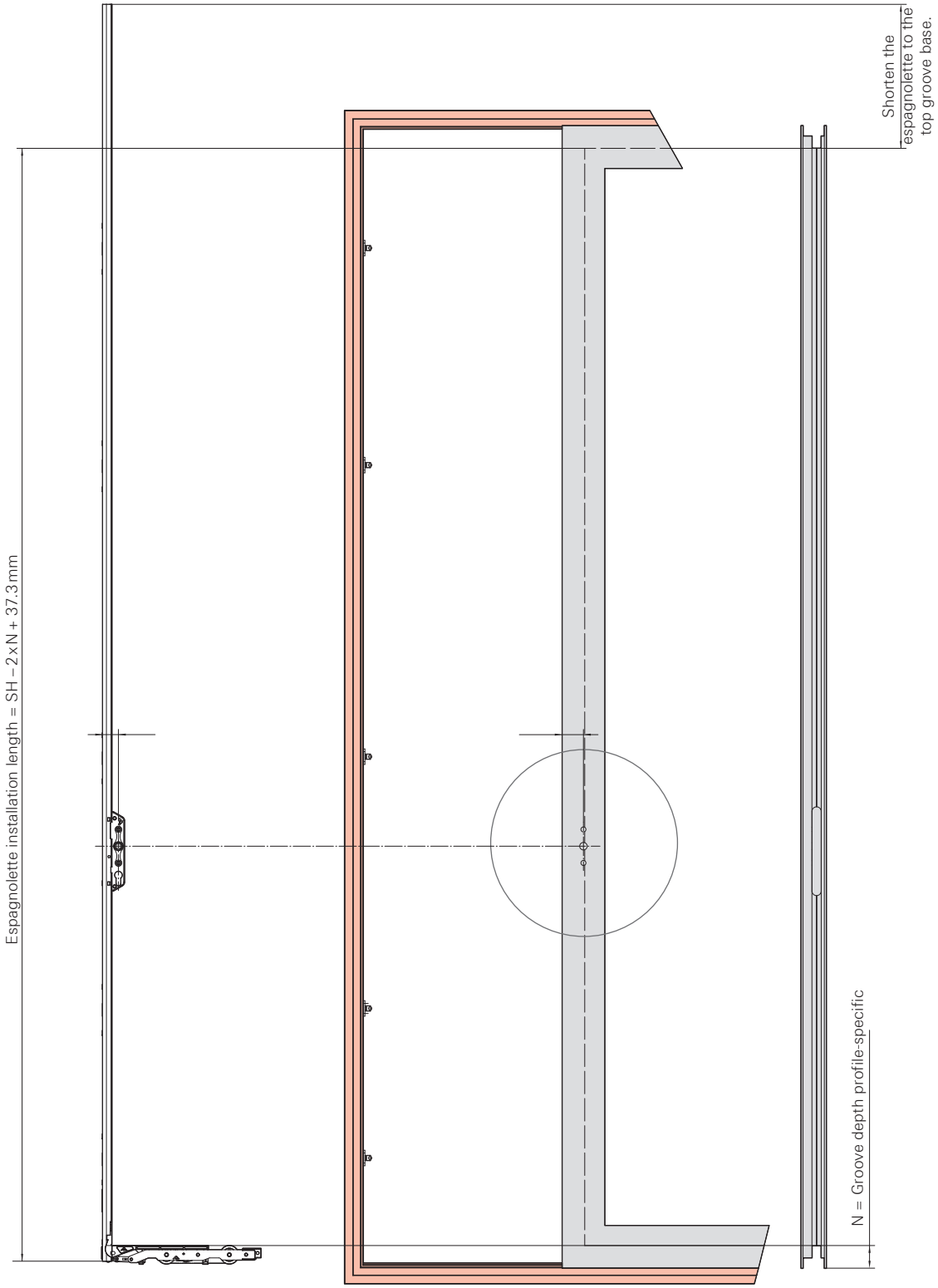


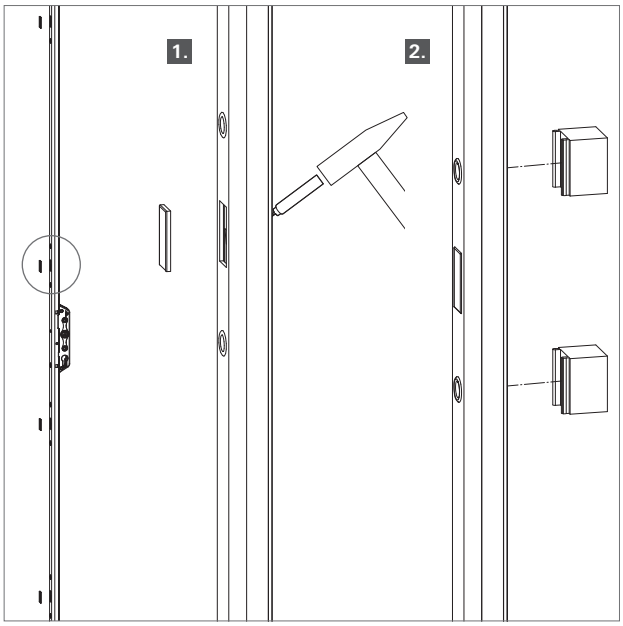
4. Insert the bogie assembly into the sash and screw in place; screws to be selected by the client.
(Recommendation: Self-tapping screw ISO 7050 DM 4.2 x length (selected by client) C – Z, stainless-steel A2)

NOTE!
A different length may be required for transversely inserted screws (length selected by client).
The first screw level through aluminium must have a thickness of min. 2 mm.
If the first screw level has a wall thickness of < 2 mm, the client must use inserts or clinch nuts with a thickness of min. 2 mm.

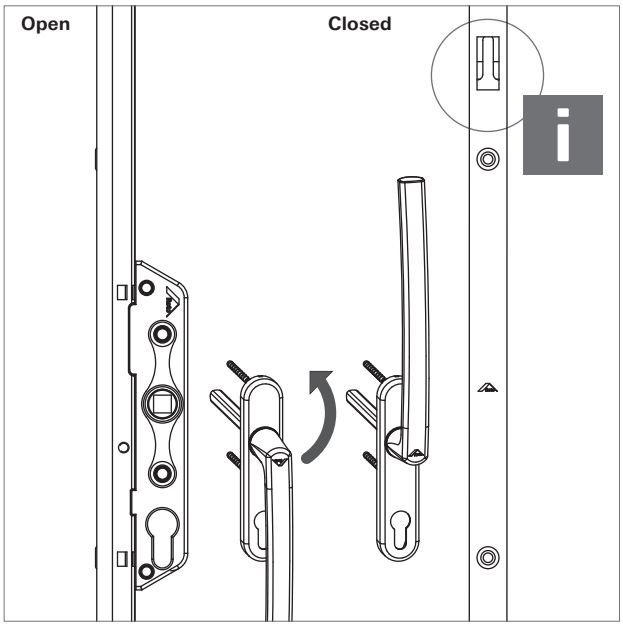
1. Shorten the espagnolette to the top groove base (see picture) Calculation: SH – 2 x N + 37.3 mm

NOTE!
Crop the short espagnolette (63512) in the open position.



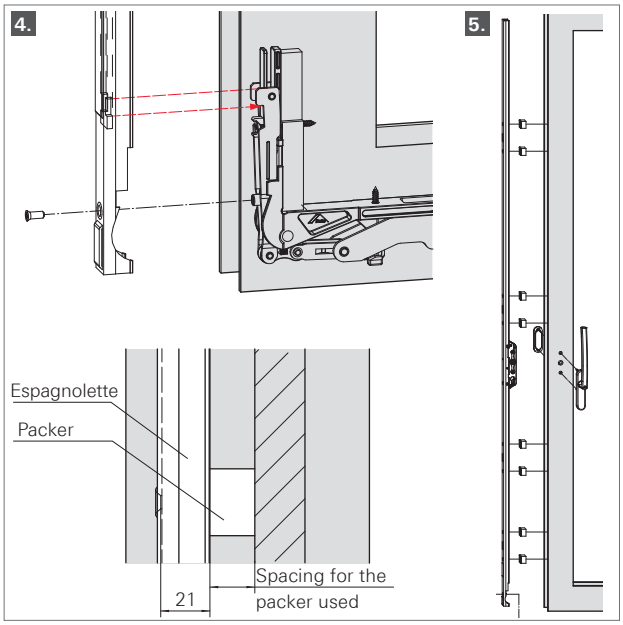


1. Break the caps out of the espagnolette.
2. Mount the packers on the espagnolette below each screw hole.



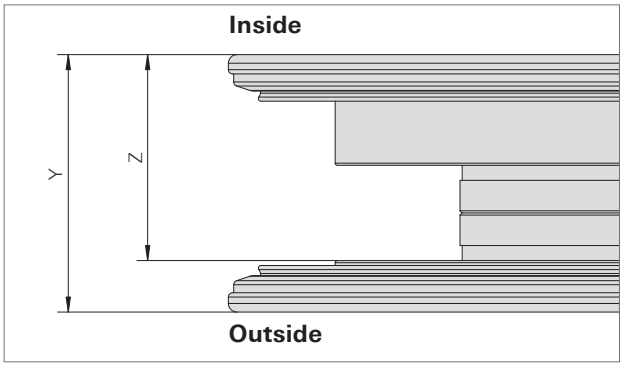
3. Before installation, move the espagnolette into the closed position. Check the faceplate position.

NOTE!
Faceplate position when espagnolette in closed position.

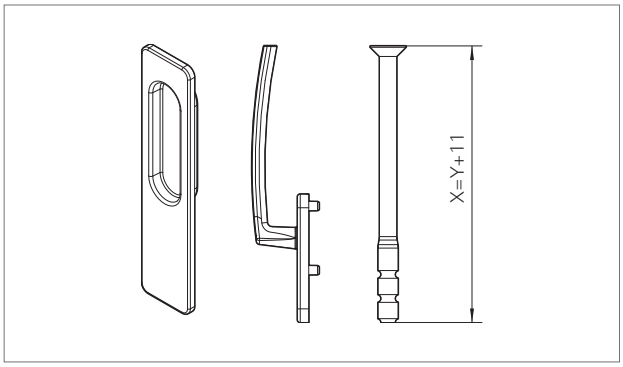


4. Place the espagnolette on the bogie, making sure that the connecting rod of the espagnolette latches into the groove of the bogie mechanism. Tighten the screw.
5. Tighten all the espagnolette screw fittings; screws to be selected by the client. (Recommendation: Self-tapping screw ISO 7050 DM 4.2 x length (selected by client) C – Z, stainless-steel A2)

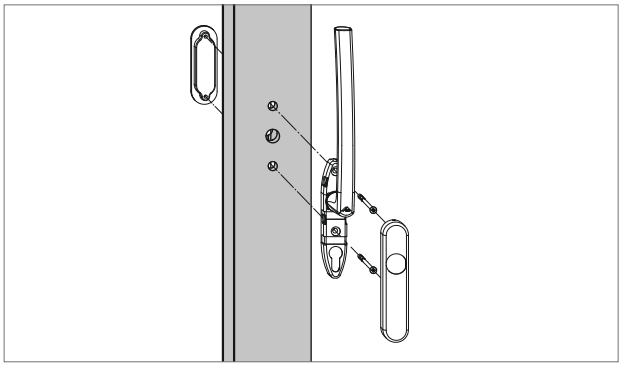
NOTE!
The first screw level through aluminium must have a thickness of min. 2 mm.
If the first screw level has a wall thickness of < 2 mm, the client must use inserts or clinch nuts with a thickness of min. 2 mm.

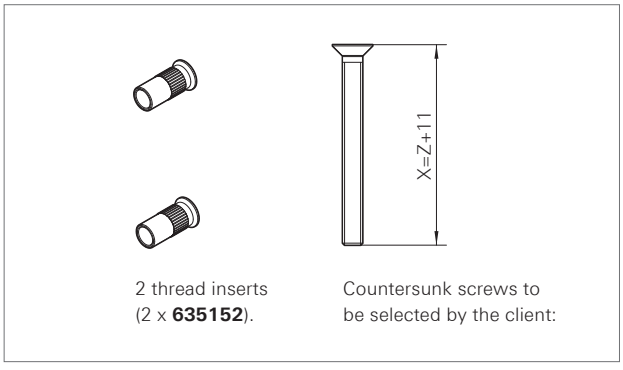


Trimming the screws for installation of the handle

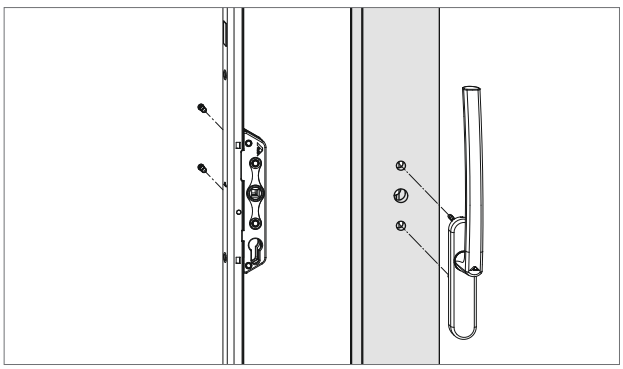


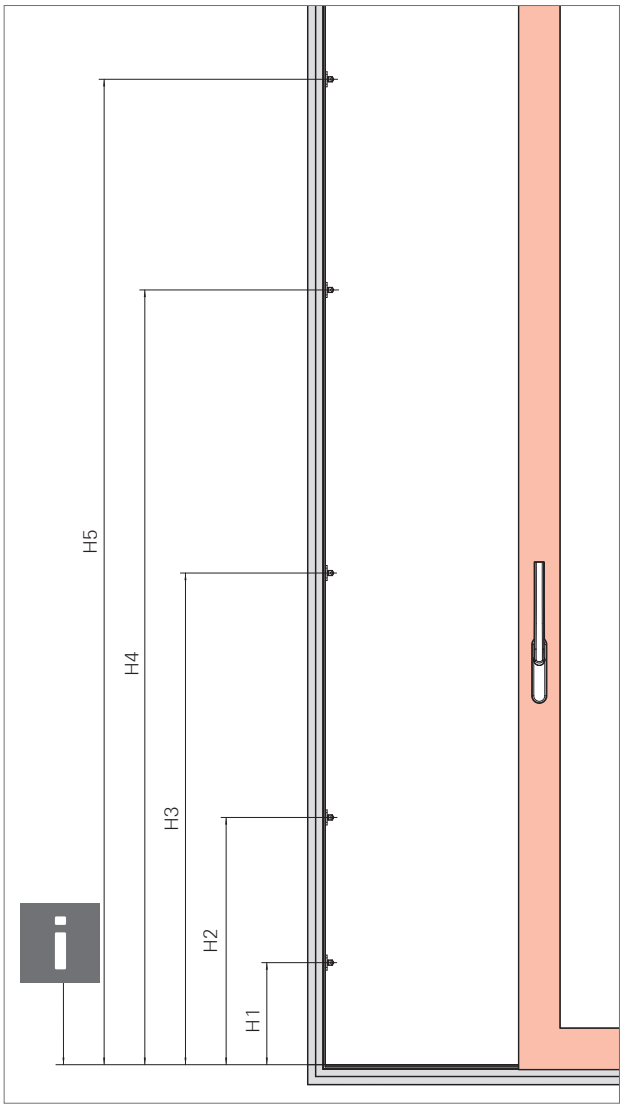
Installing a recessed grip or external handle:
Shorten the screw to X = Y + 11





Installing an inside handle without using a recessed grip or external handle:
Use 2 thread inserts (2 x 63512).
Countersunk screws to be selected by the client:
2 x countersunk screws M5, to DIN ISO 10642 or:
corresponding length: X = Z + 11



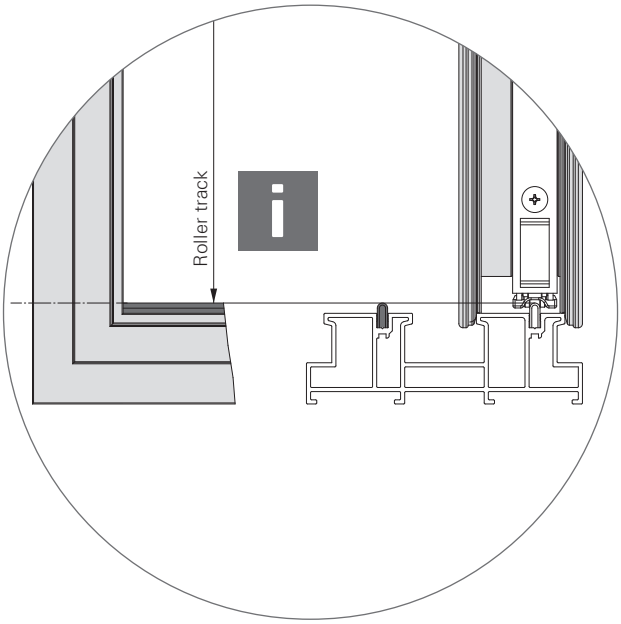


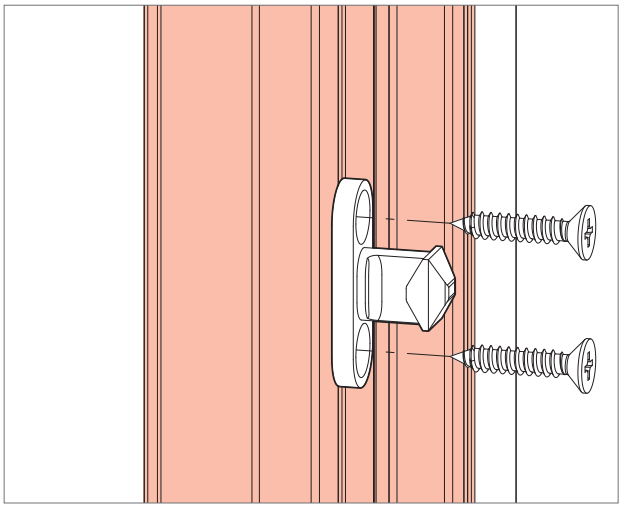
1. Define the striker position.

NOTE!
The dimensions in the drawing refer to the roller track level.

Striker positions

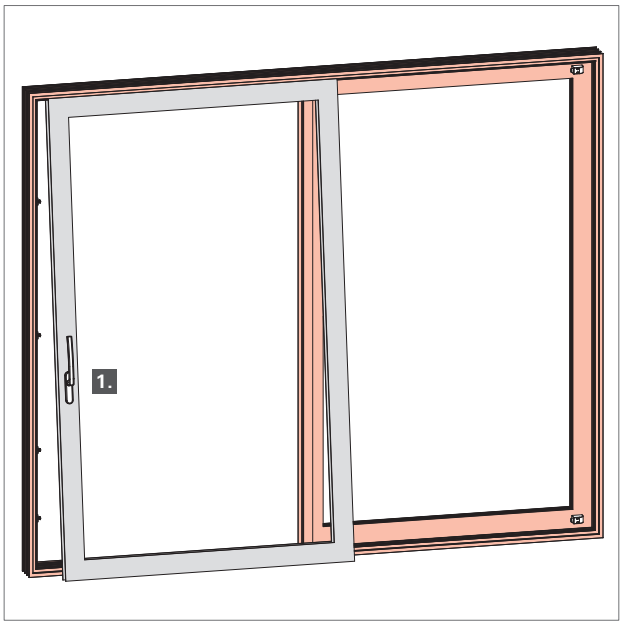
Designation	SH/mm	H1	H2	H3	H4	H5
Roto Patio Lift Espagnolette 300 PC	1000 – 1800	251	1193	–	–	–
Roto Patio Lift Espagnolette 300 PC	1000 – 1800	251	608	1209	–	–
Roto Patio Lift Espagnolette 300 PC	1801 – 2200	251	608	1209	1601	–
Roto Patio Lift Espagnolette 300 PC	2201 – 2600	251	608	1209	1906	–
Roto Patio Lift Espagnolette 300 PC	2601 – 3000	251	608	1209	1906	2423
Roto Patio Lift Espagnolette 300	1801 – 2200	251	608	1209	1601	–
Roto Patio Lift Espagnolette 300	2201 – 2600	251	608	1209	1906	–
Roto Patio Lift Espagnolette 300	2601 – 3000	251	608	1209	1906	2423



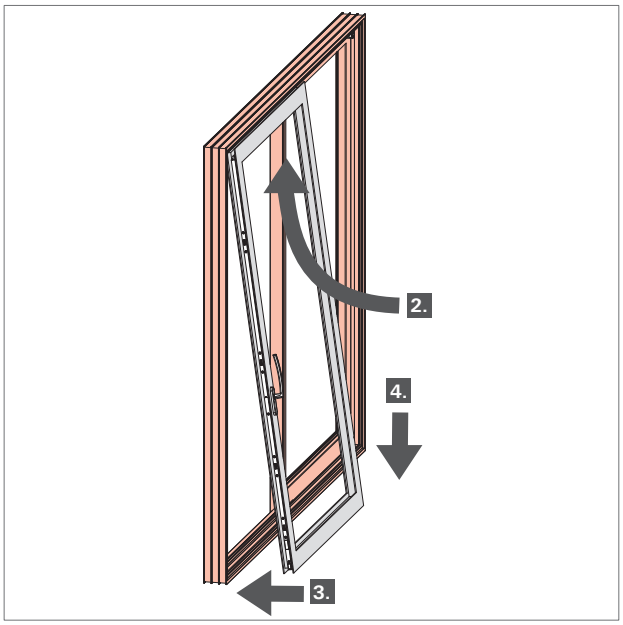


2. Install the strikers; countersunk screws to be selected by the client.
(Recommendation: Self-tapping screw ISO 7050 DM 4.2 x length (selected by client) C – Z, stainless-steel A2)

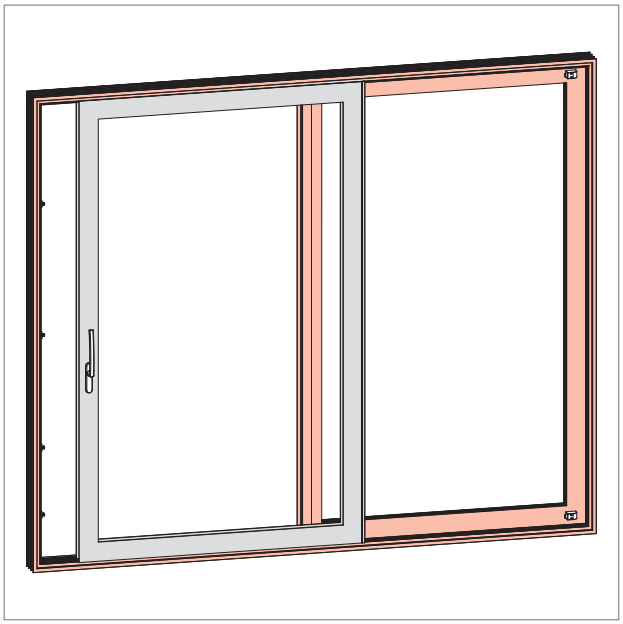
NOTE!
The first screw level through aluminium must have a thickness of min. 2 mm.
If the first screw level has a wall thickness of < 2 mm, the client must use inserts or clinch nuts with a thickness of min. 2 mm.

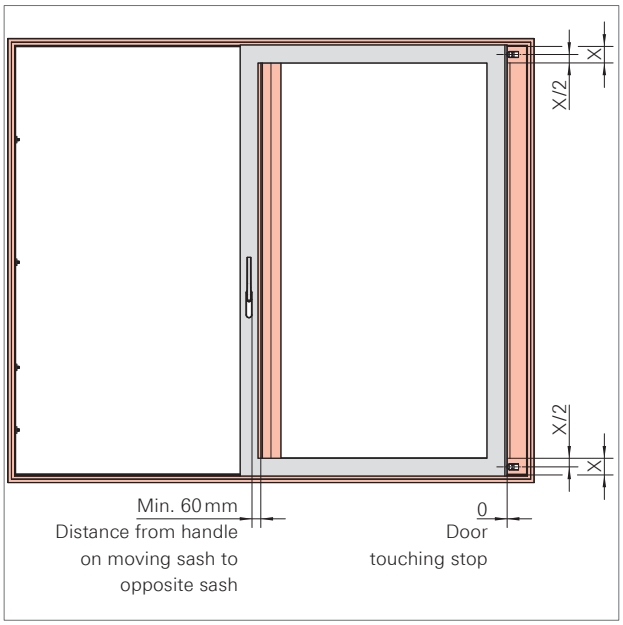


1. Move the handle into the sliding mode.



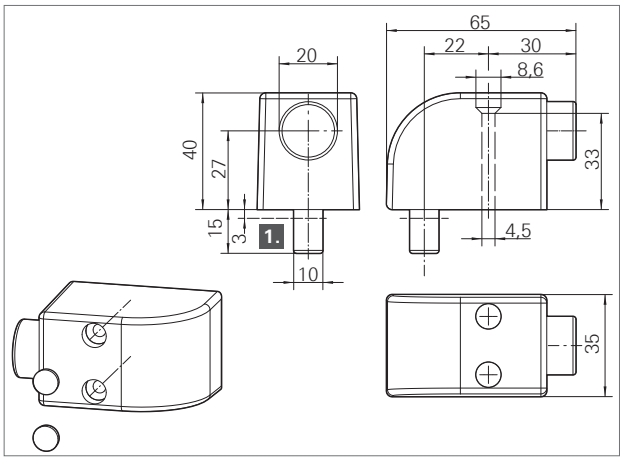
2. Insert the top of the sash into the track at an angle.
3. Swing the bottom of the sash into place.
4. Lower the sash.



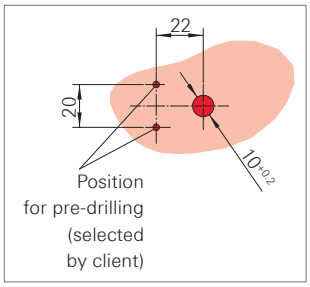


1. Define the end stop position.

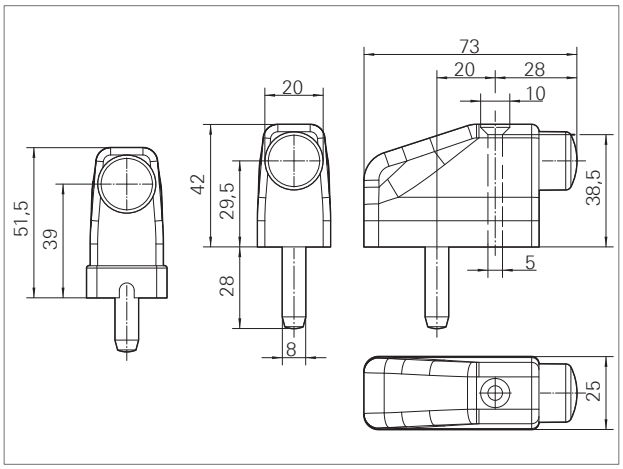
NOTE!
For Diagram D: shorten the overhang of the 10 mm steel bolt from 15 mm to 3 mm before installation ①.
Perform this step before installing the bogie.
The screws must not affect the hardware.



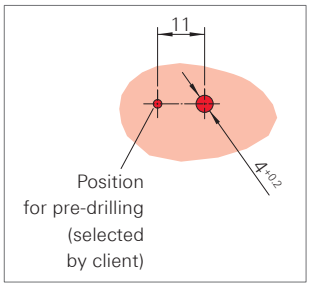
2. **Stop height 27 mm:**
Pre-drill.



3. Screw the end stop on/screw Ø 4.2 mm x length to be selected by client.

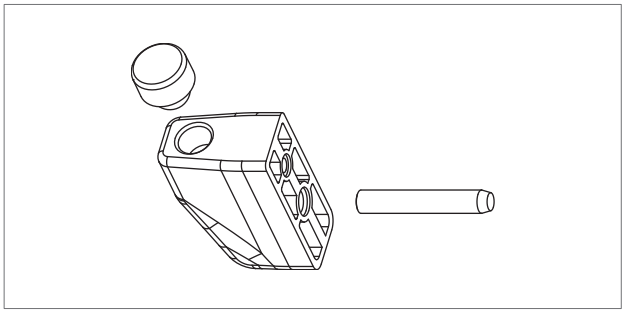


2. **Stop height 30 mm/39 mm with packer:**
Pre-drill.

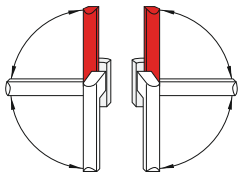
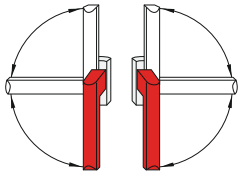
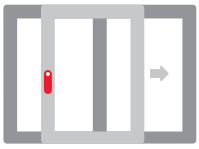
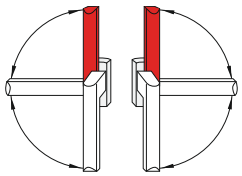
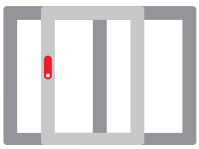
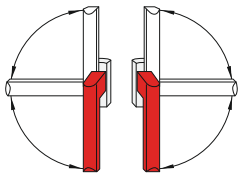
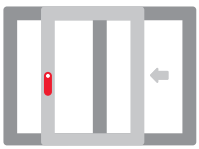
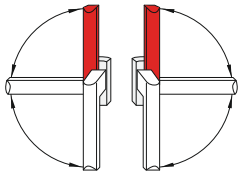


3. Screw the end stop on/screw Ø 4.8 mm x length to be selected by client.

4. Pre-assemble pin and damper.



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

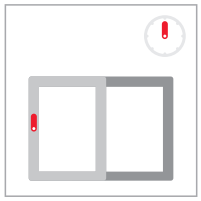
Handle position	Sash position	Symbol	Meaning
			Closed sash position.
			Opened slide position of the sash.
			Fixed sash open position.
			Closed slide position of the sash.
			Closed sash position.

The following symbols and signs can by used on windows and balcony doors to protect the end-user.
Please order stickers separately (OPR_21_DE).

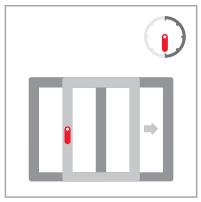
Roto Patio HS

Beschlagsystem für Hebeschiebe-Elemente
Hardware system for Lift&Slide doors

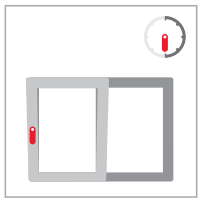
geschlossen
closed



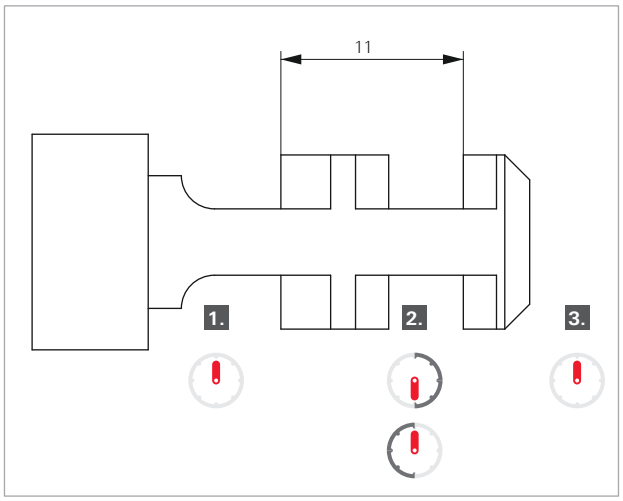
schieben
slide



Spaltlüftung
Night-ventilation



10/2012 OPR_21_DE_v0



1. Closed position.
2. Open the sash, open 11 mm, close sash.
   The sash is in the night ventilation position.
3. Open position.

Maintenance

WARNING!
Risk of injury from improperly conducted maintenance work!
Incorrect maintenance can result in severe personal injury or property damage.

- Before starting work, ensure that there is sufficient installation space.
- Maintain order and cleanliness at the installation site.
- Ensure that the window or balcony door is prevented from suddenly opening or slamming during maintenance work.
- Get a specialist company to carry out adjustment work on hardware, as well as replacement of parts and hinging/ unhinging of sashes.
- Do not unhinge the window for maintenance work.

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

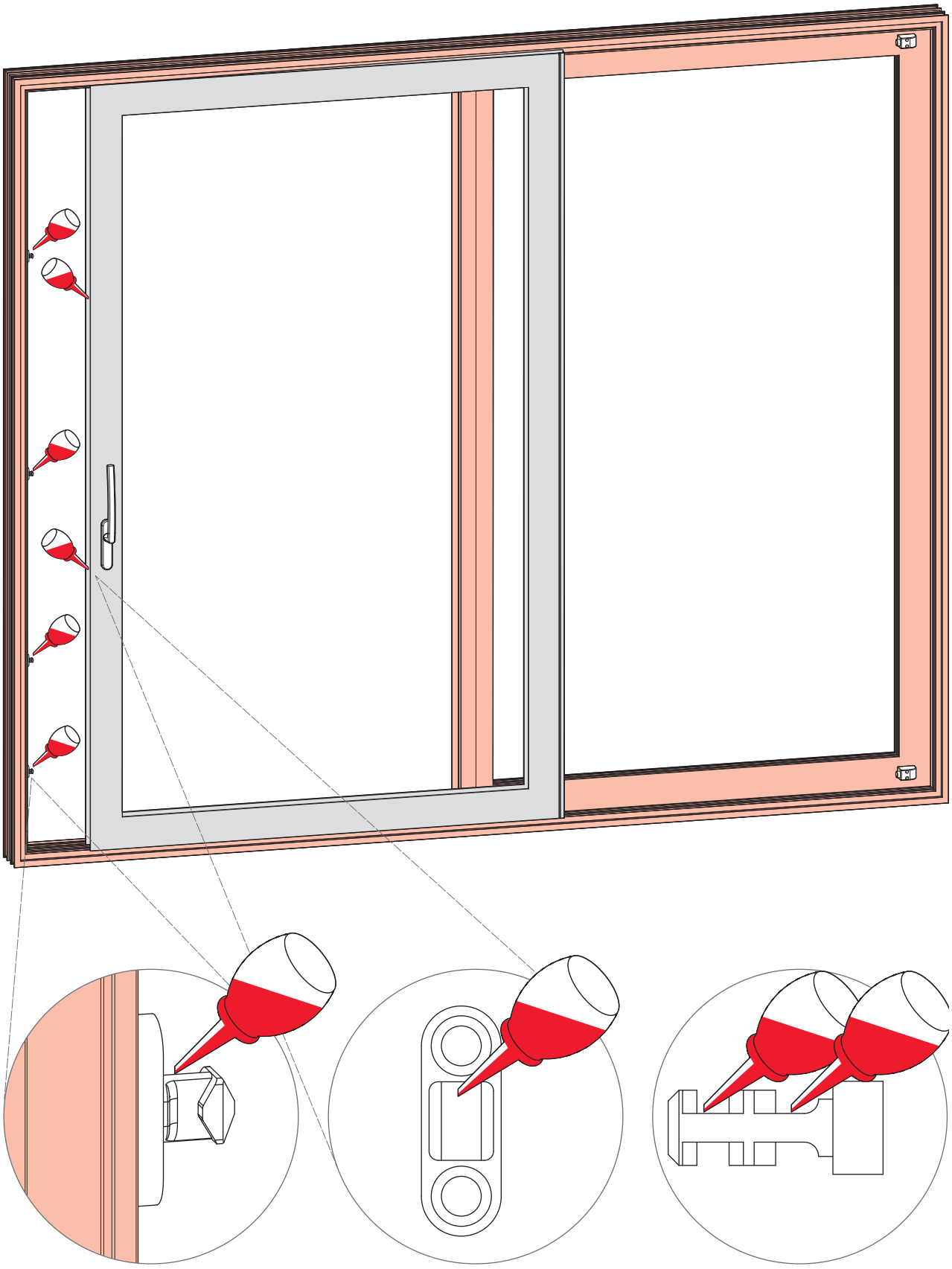
	Specialist company	End-users
If necessary, tighten fixing screws.	■	–
Replace damaged screws.	■	–
If necessary, replace components.	■	–
Lubricate all moving components with acid-free, non-resinous oil from a specialised dealer.	□	□
Lubricate steel strikers with acid-free, non-resinous grease from a specialised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

- Remove leaking or residual grease at the lubrication points and dispose of it in accordance with the valid local regulations.
- Collect old oil in suitable containers and dispose of it in accordance with the environmental regulations.

The hardware overview shows the positioning of the lubrication points. The overview provided does not necessarily correspond to the installed hardware. The number of lubrication points depends on the size and design of the window.



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.	☐	☐
Check all locking points for proper operation.	☐	☐
The hardware's smooth operation can be checked by moving the window handle:		
– Locking and unlocking torque in accordance with DIN 18055: max. 10 Nm.	■	–
– The torque can be checked using a torque wrench.	■	–
– Smoother operation can be achieved 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, acidic cleaning or scouring agents.	☐	☐
Only use mild, pH-neutral cleaning agents in diluted form.	☐	☐
Use a soft cloth only 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; their application must be adapted accordingly for each specific individual case. The window and balcony door manufacturer must ensure that builders and end-users are made aware of the importance of these maintenance instructions. Roto Frank AG recommends that window manufacturers enter into maintenance agreements with their end-users.

Protection against corrosion

	Specialist company	End-users
On windows and balcony doors made of oak or other types of timber with a high concentration of (tannic-) acid, ensure that by means of a suitable window surface treatment that these substances cannot evaporate out of the timber. The hardware must not come into direct contact with untreated timber surfaces.	■	–
Aggressive vapours (e.g. from formic or acetic acid, ammonia, amine or ammonia compounds, aldehydes, phenols, chlorine, tannic acid etc.) must be kept away from the vicinity of the windows at all times.	■	–
Never use acetic or crosslinked acidic sealing compounds or those with the contents listed above, since both direct contact with the sealing compound and vaporisation can attack the hardware's surface.	■	–
Only electrogalvanised, zinc-plated and passivated screws may be used for fixing the hardware components in place.	■	–
Never use stainless-steel screws.	■	–

■ = 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, mortar, cement, etc.) or similar materials with water before they set.	☐	☐
Keep the hardware free from deposits and soiling.	☐	☐
Never use aggressive, acidic cleaning or scouring agents.	☐	☐
Only use mild, pH-neutral cleaning agents in diluted form.	☐	☐
Use a soft cloth only 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 (permanently) 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 air cannot condense in the hinge and rebate areas: – Ventilate intensively 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. 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 to the windows, exclude all hardware components from this treatment to protect against contamination.	☐	☐
Use only adhesive tapes which do not damage the varnish layers. If in doubt, ask the window manufacturer.	☐	☐

■ = 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

Transport/handling of the window elements

DANGER!
Risk of fatal injury due to incorrect handling and transport!
Incorrect handling and unsuitable transportation of window elements can lead to hazardous situations and cause severe or even fatal accidents.

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 the hardware is in the locked position to prevent the sash from opening unexpectedly. Use suitable securing equipment to do this.
- Use only transport fastenings designed for the respective clearance.
- Wherever possible, transport the windows in the intended installation position. If transport in the intended installation position is not possible, unhinge the sash, and transport it separately from the corresponding frame.

During transport, loading, and unloading, especially if auxiliaries such as suction cups, transport nets, forklifts, or cranes are used for support, reaction forces may arise which could damage or overload the installed hardware. Therefore, observe the following instructions during all transport, loading, and unloading:

- The type and the force application points when transporting, loading, and unloading have a significant effect on the reaction forces which arise.
  - Always choose the force application points so that the resulting reaction forces are dissipated appropriate to the design of the hardware components for the intended installation location.
    This applies particularly for the hinge positions.

Transport inspection

Check the delivery immediately on receipt to ensure it is complete and there is no transport damage.

NOTE!
File a claim for 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 them as metal scrap.
Dispose of PVC packers as plastic recycling waste.

Roto
Creates inner values

Roto Frank AG
Window and door technology

Wilhelm-Frank-Platz 1
70771 Leinfelden-Echterdingen
Germany

Telephone +49 711 7598 0
Telefax +49 711 7598 253
info@roto-frank.com

www.roto-frank.com

MTS/B&N Issue date: May 2013 Subject to change. IMO_245_EN_v0

From a single source: Hardware systems to meet all challenges:

Roto Sliding | Hardware systems for large sliding windows and doors
Roto Door | Matching hardware technology “for everything to do with doors”
Roto Equipment | Additional technology for windows and doors
Roto Tilt&Turn | The Tilt&Turn hardware system for windows and balcony doors