



Roto Patio Inline | SR

The reliable hardware system for Parallel Sliding elements

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1 General information

1.1 Version history

Version	Date	Changes
v0	03/03/2025	Publication

1.2 Instructions

This manual contains important information, instructions, application diagrams (max. sash sizes and weights) and assembly instructions for the installation, maintenance and operation of hardware.

The information and instructions contained in this document refer to products belonging to the Roto hardware system named on the front page.

All steps must be completed in sequence.

The following documents apply in addition to these instructions:

- Catalogue: CTL_1

The following guidelines also apply:

Gütegemeinschaft Schlösser und Beschläge e.V.

- Directive TDBK: Attachment of supporting fitting components for turn-only and tilt&turn fittings
- Directive VHBE: Hardware for windows and balcony doors – Guidelines/ advice for end-users
- Directive VHBH: Hardware for windows and balcony doors – Guidelines/ advice on the product and on liability

VFF (German Window and Facade Association)

- TLE.01: Correct handling of ready-to-install windows and external doors during transport, storage and installation
- WP.01: Maintenance of windows, facades and external doors – Maintenance, care and inspection – Information for sales
- WP.02: Maintenance of windows, facades and external doors – Maintenance, care and inspection – Measures and documents
- WP.03: Maintenance of windows, facades and external doors – Maintenance, care and inspection – Maintenance agreement

Additional guidelines

- Instructions and information issued by profile manufacturers, e.g. manufacturers of windows and balcony doors
- Instructions and information issued by screw manufacturers
- The applicable regulations, directives and national laws

Storing the instructions

These instructions are an important part of the product. The instructions must be stored so that they are always to hand.

Explanation of the markings

The manual uses the following markings for emphasis (e.g. in figures or instructions):

Marking	Meaning
	Optional / alternative components seated in the sash
	Sash / components seated in the sash
	Optional / alternative components seated in the frame
	Frame / components seated in the frame
	Drill holes, routing, screw positions
	Unaffected components / indirectly affected components
	Components, arrows or movements that have just been described
	Item number
[1]	Legend
[A]	Steps



INFO

Any dimensions without a unit in the instructions are given in millimetres (mm). Other units of measurement are clearly indicated by the presence of the differing unit.



INFO

Figures are provided in the left-hand version (DIN 107). The process for the right-hand version is mirror-inverted.

1.3 Symbols

Symbol	Meaning
■	First-level list
□	Second-level list
→	(Cross) reference
▷	Result
►	Unnumbered step
1.	Numbered step
a.	Numbered second-level step
⇒	Requirement

1.4 Pictographs

Symbol	Meaning
	Aluminium

1.5 Product features

Symbol	Meaning
	Lockable
	Description
	Component width
	Backset
	Colour code, standard
	Colour code, Roto
	Colour
	Sash height
	Sash weight
	Component height
	Information
	Length
	Component length
Nº	Material number
	Installation type
	Profile system
	Number of locking hooks
	Height of locking hook
	Number of screws

Symbol	Meaning
	Type of screws
	Packaging

1.6 Abbreviations

Abbreviation	Meaning
CTL	Catalogue
BS	Backset
SW	Sash width
S.kg	Sash weight
SH	Sash height
IMO	Installation instructions
kg	Kilograms
L	Left
Mat. no.	Material number
Max.	Maximum
Min.	Minimum
mm	Millimetres
Nm	Newton metres
POM	Polyoxymethylene (thermoplastic)
R	Right
e.g.	For example

1.7 Target groups

The information in this document is directed at the following target groups:

Hardware dealers

The “hardware dealers” target group includes all companies and individuals that purchase hardware from hardware manufacturers for resale, without modifying or further processing the hardware.

Window and balcony door manufacturers

The “window and balcony door manufacturers” target group includes all companies and individuals that purchase hardware from hardware manufacturers or hardware dealers and further process the hardware by integrating it in windows and balcony doors.

Building element dealers or installation companies

The “building element dealers or installation companies” target group includes all companies and individuals that purchase windows and balcony doors from window and balcony door manufacturers for resale and for installation in construction projects, without modifying the windows or balcony doors.

Builders

The “builders” target group includes all companies and individuals who place orders for the manufacture of windows and balcony doors for installation in their construction projects.

End users

The “end users” target group includes all individuals who use the installed windows and balcony doors.

1.8 Target groups' obligation to give instructions



INFO

Each target group must fulfil their obligation to give instructions in full.

Unless specified otherwise in the text below, documents and information can be passed on as a printed document, on a data storage device or via the Internet.

Responsibility of hardware dealers

Hardware dealers must pass the following documents on to the window and balcony door manufacturer:

- Catalogue
- Installation, maintenance and operation instructions
- Directive on attachment of supporting fitting components for turn-only and tilt&turn fittings (TBDK)
- Guidelines/advice on the product and on liability (VHBH)
- Guidelines/advice for end-users (VHBE)

Responsibility of the window and balcony door manufacturer

The window and balcony door manufacturer must pass the following documents on to building element dealers or the builder, even if a subcontractor (installation company) is involved:

- Installation, maintenance and operation instructions
- Directive on attachment of supporting fitting components for turn-only and tilt&turn fittings (TBDK)
- Guidelines/advice on the product and on liability (VHBH)
- Guidelines/advice for end-users (VHBE)

They must ensure that the end users are provided with the documents and information intended for them in printed format.

Responsibility of building element dealers and the installation company

Building element dealers must pass the following documents on to the builder, even if a subcontractor (installation company) is involved:

- Installation, maintenance and operation instructions (with a focus on hardware)
- Guidelines/advice on the product and on liability (VHBH)
- Guidelines/advice for end-users (VHBE)

Responsibility of the builder

The builder must pass the following documents on to the end user:

- Installation, maintenance and operation instructions (with a focus on hardware)
- Guidelines/advice for end-users (VHBE)

1.9 Copyright protection

The contents of this document are copyright-protected. This content can be used when working with the hardware. Any other use is not permitted without written permission of the manufacturer.

1.10 Limitation of liability

All information and instructions contained in this document have been compiled in consideration of the applicable standards and regulations, the latest developments in technology and many years of knowledge and experience.

The hardware manufacturer assumes no liability for damage caused by:

- Failure to comply with this document and all product-specific documents and other applicable directives (see the chapters entitled "Security" and "Stipulated use").
- Improper use / misuse (see the chapters entitled "Security" and "Stipulated use").
- Insufficient invitation to tender, non-compliance with installation specifications and non-compliance with the application diagrams (where available).
- Increased contamination.

Claims made by third parties against the hardware manufacturer on account of damage resulting from misuse or failure to comply with the obligation to give instructions on the part of hardware dealers, window, door and balcony door manufacturers and building element dealers or the builder are passed on accordingly.

The obligations agreed in the delivery contract, the general terms and conditions, the hardware manufacturer's terms and conditions of delivery and the legal provisions applicable when the contract was concluded shall apply.

The warranty only covers original Roto components.

We reserve the right to make technical changes as part of improvement to performance characteristics and further development.

1.11 Preserving the surface finish



ATTENTION

Surface treatments may cause property damage.

Surface treatments (e.g. painting and varnishing) on elements can damage components or prevent them from working properly.

- ▶ For masking, only use adhesive tape that does not damage the paint coats. Consult the manufacturer if in doubt.
- ▶ Protect components against direct contact with the surface treatment.
- ▶ Protect components against contamination.



ATTENTION

Using incorrect cleaning agents and sealing compounds may cause property damage.

Cleaning agents and sealing compounds may damage the surfaces of components and gaskets.

- ▶ Do not use aggressive or flammable liquids, acidic cleaners or abrasive cleaners.
- ▶ Only use mild, pH-neutral cleaning agents that have been diluted.
- ▶ Apply a thin protective film to the components, for example using a cloth soaked in oil.
- ▶ Avoid aggressive vapours (e.g. produced by formic acid, acetic acid, ammonia, amine compounds, ammonia compounds, aldehyde, carboic acid, chlorine, tannic acid) around the element.
- ▶ Do not use any acetic acid-crosslinking or acid-crosslinking sealing compounds or those with the aforementioned constituents as both direct contact with the sealing compound and its fumes can corrode the surface of the components.



ATTENTION

Contamination may cause property damage.

Contamination prevents components working properly.

- ▶ Remove deposits and contamination caused by construction materials (e.g. plaster, gypsum).
- ▶ Keep components free of deposits and contaminants.



ATTENTION

(Permanently) damp room air may cause property damage.

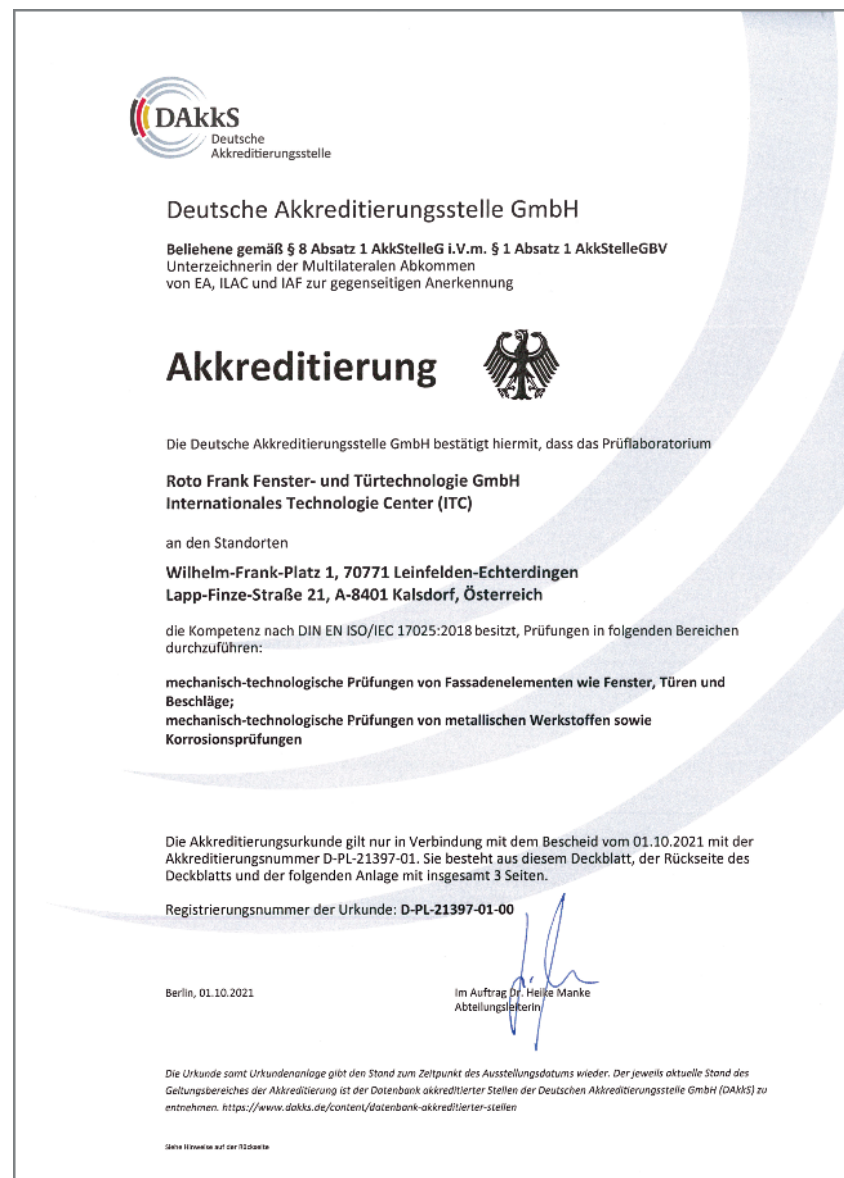
Damp room air can lead to mould growth and corrosion caused by condensation.

- ▶ Provide adequate ventilation for components, particularly during the construction phase.
- ▶ Intensively air out the room several times per day by opening all elements for approximately 15 minutes. If intensive airing is not an option, place the elements in the tilt position and provide airtight masking inside the room, e.g. if there is fresh screed that cannot be walked on or must not be exposed to draughts. Discharge any humidity present in the room air to the outside using condensation dryers.
- ▶ Establish a ventilation plan for more complex construction projects if necessary.
- ▶ Provide adequate ventilation during holiday periods as well.

1.12 Certifications

1.12.1 International Technology Centre (ITC)

Roto has owned a modern International Technology Centre (ITC) at its Leinfelden headquarters since October 1996. This facility is available for both our own material and product testing as well as for inspecting finished products made by Roto market partners.



The ITC is accredited in accordance with DIN EN ISO / IEC 17025 and has the expertise required to perform tests in areas including mechanical technological testing of facade elements such as windows, doors and hardware, as well as metallic materials.

Achieving accreditation in accordance with DIN EN ISO / IEC 17025 represents the highest distinction for a test institute in the private sector. The requirements for this are an extensive quality management system, trained personnel, high-quality test rigs and measuring instruments, as well as continuous external monitoring by the accreditation authorities.

1.12.2 Quality management

The certification in accordance with the international standard DIN EN ISO 9001 certifies that Roto plans, documents and appropriately implements the entire development, production and sales process systematically. Starting with development and design through to quality planning, production and assembly right through to sales and customer service.

The certification is an external indication of the quality awareness practised at Roto:

- Roto's objective is to ensure continuous product and service improvements for the benefit of its customers.
- Roto offers its customers innovative, environmentally friendly and technically sophisticated architectural hardware technology.
- Roto products are supplied punctually worldwide with constant guaranteed quality.
- Roto's comprehensive view regards all business activities – including all the activities within the company – to be the key to achieving long-term corporate success.
- Roto employees are supported in their personal development and fulfil Roto's high quality requirements in their day-to-day work. Their work is performance and goal-oriented.

Certificate		ift ROSENHEIM
Certificate-No.: 791-9004105-1-3		
<p>Subject Quality Management System DIN EN ISO 9001:2015</p> <p>Company (Headquarters) Roto Frank Fenster- und Türtechnologie GmbH Wilhelm-Frank Platz 1 DE - 70771 Leinfelden-Echterdingen</p> <p>Scope of the headquarters Development, design, production and sales of window and door technology</p> <p>Further sites see appendix to the certificate</p> <p>Rules for sites certification During the certification-audit it was demonstrated that the company and all sites listed in this certificate have established and are applying a quality management system in accordance with DIN EN ISO 9001:2015 "Quality Management Systems-Requirements".</p> <p><i>Christian Kehrer</i> Christian Kehrer Head of Certification and Surveillance Body</p> <p>ift Rosenheim 18.05.2024</p> <p>Initial certification: 18.05.2021 Contract No.: 791 9004105 Valid until: 17.05.2027</p>		<p>Basel: ISO 9001</p>  <p>Validity The certificate is valid for three years. During this time the company is surveyed annually. The certificate is only valid in combination with the accompanying certification and surveillance contract. If Q-Zert shall be informed immediately in writing of all changes to the qualifications for certification and supplied with copies of all resulting new management documents.</p> <p>Notes on Publication The certificate shall only be reproduced unchanged. Regulations for the use of reports are given in the „Allgemeine Bedingungen für die Zertifizierung von Managementsystemen“.</p> <p>The company is entitled to use the "ift-certified" mark in accordance with the ift "Zeichensatzung" (Rules on the use of the ift-mark).</p> <p>Identity Check</p>  <p>www.ift-rosenheim.de/ ift-zertifiziert ID: 266-BCDA2</p>
<p>ift Rosenheim GmbH Theodor-Heuss-Str. 7-9 D-83029 Rosenheim</p> <p>Contact: Phone: +49 8331 261-0 Fax: +49 8331 261-290 info@ift-rosenheim.de www.ift-rosenheim.de</p> <p>Accredited Certification Body for Management Systems DIN ISO/IEC 17021-1</p> <p>IAF DAKKS</p>		

2 Security

This manual contains instructions relating to safety. The principal safety information in this chapter includes information and instructions relevant to the safe use or maintaining the safe condition of the product. Warning instructions that relate to handling warn of residual risks and are located before steps that are relevant to safety.

- Follow all of the instructions in order to prevent personal injury and property and environmental damage.

2.1 Presentation and structure of warning instructions

The warning instructions relate to individual actions and are structured as follows with a warning symbol:



DANGER

Nature and source of the danger.

Explanation and description of the danger and the implications.

- Measures to take to avert the danger.

2.2 Security levels of warning instructions

The warning instructions that relate to handling are identified differently according to the severity of the associated danger. The signal words and the associated warning symbols used are clarified below.



DANGER

Immediate risk of death or serious injuries.

- Observe these warning instructions to avoid personal injuries.



WARNING

Potential risk of death or serious injuries.

- Observe these warning instructions to avoid personal injuries.



CAUTION

Risk of injuries

- Observe these warning instructions to avoid personal injuries.



ATTENTION

Reference to property or environmental damage.

- Observe these warning instructions to avoid property or environmental damage.

2.3 Stipulated use

The hardware system described in these instructions is for installation in sliding elements. The hardware system is only intended for further processing on elements for vertical installation made from the materials described in these instructions. The hardware system opens sashes in elements and closes them tightly.

Stipulated use also includes compliance with all safety information and specifications contained in these instructions, the other applicable documents and the applicable regulations, directives and national laws.



2.3.1 Misuse

Any use and processing of the products that goes beyond or differs from the stipulated use is considered misuse and can lead to hazardous situations.



WARNING

Misuse may pose a risk of death!

Misuse and incorrect installation of hardware can lead to serious injuries.

- ▶ Only use hardware combinations that have been approved by the hardware manufacturer.
- ▶ Only use original accessories or those that have been approved by the hardware manufacturer.
- ▶ Note the product-related documentation → *from page 7*.

2.3.2 Usage restriction

Opened sashes in windows and balcony doors, and windows and balcony door sashes that are unlocked or placed in ventilation positions, only have a shielding effect. They do not meet the following requirements:

- Joint sealing
- Driving rain impermeability
- Sound insulation
- Thermal insulation
- Burglary inhibition

2.4 Stipulated use for end users

On windows or balcony doors with sliding hardware, window sashes or balcony door sashes can be moved horizontally by operating a handle.

When closing a sash and locking the hardware, the gasket counter force must generally be overcome.



WARNING

Opening and closing sashes in an uncontrolled manner may pose a risk of fatal injury!

Opening and closing the sash in an uncontrolled manner may lead to serious injuries.

- ▶ Ensure that the sash does not collide with the frame, opening restrictor (buffer) or other sashes when it is moved into the fully open or closed position.
- ▶ Ensure that the sash is slowly guided by hand throughout its entire movement range, until it has been brought into a fully closed or opening position.
- ▶ Ensure that the sash coverage at the top is so large that the sash is prevented from falling out, even if the window or hardware components is / are operated incorrectly.



ATTENTION

Opening and closing sashes in an uncontrolled manner may result in property damage.

Opening and closing the sash in an uncontrolled manner may cause the element to malfunction.

- ▶ Ensure that the sash does not collide with the frame, opening restrictor (buffer) or other sashes when it is moved into the fully open or closed position.
- ▶ Ensure that the sash is slowly guided by hand throughout its entire movement range, until it has been brought into a fully closed or opening position.

Any use and processing of the products that goes beyond or differs from the stipulated use is considered misuse and can lead to hazardous situations.

No claims of any kind can be made on account of damage resulting from failure to comply with the stipulated use.

2.4.1 Misuse

Any use and processing of the products that goes beyond or differs from the stipulated use is considered misuse and can lead to hazardous situations.



WARNING

Misuse may pose a risk of death!

Misuse and incorrect installation of hardware can lead to serious injuries.

- ▶ Only use hardware combinations that have been approved by the hardware manufacturer.
- ▶ Only use original accessories or those that have been approved by the hardware manufacturer.
- ▶ Note the product-related documentation → *from page 7.*

2.5 Basic safety information

The following hazards may arise when handling the product:

2.5.1 Installation

Incorrect installation poses an immediate risk of death or serious injuries.

Incorrect installation or assembly of hardware can lead to hazardous situations or property damage. Depending on the height of the fall, this can result in serious to life-threatening injuries and glass breakage.

- ▶ Only use hardware combinations that have been approved by the hardware manufacturer.
- ▶ Only use original accessories or those that have been approved by the hardware manufacturer.
- ▶ Only use hardware components with the required materials and track shapes.
- ▶ Always have installation performed by a specialist company.
- ▶ Through sufficient sash coverage, the window manufacturer must ensure that the sash cannot fall out, even if the window or hardware components is / are operated incorrectly.

Heavy loads pose a risk of injury.

Lifting and carrying heavy loads may lead to injuries in the event of a fall or physical overexertion.



- ▶ Note the applicable accident prevention regulations.
- ▶ Transport heavy loads with two people and use suitable transportation means (such as an industrial truck).

Physical strain may cause damage to health.

Moving heavy loads for extended periods leads to physical injury in the long term.

- ▶ When carrying and lifting by hand, comply with a maximum weight of 25 kg for men and 10 kg for women.
- ▶ Carry and lift even small loads with an ergonomically correct posture.

2.5.2 Use

Falls from open windows and balcony doors present an immediate risk of death and pose the risk of serious injuries.

Opened sashes of windows and balcony doors create a danger zone. Depending on the height of the fall, this can result in serious to life-threatening injuries and glass breakage.

- ▶ Take care when in the vicinity of open windows and balcony doors.
- ▶ Keep children and anyone unable to understand the risks away from the hazardous area.

Trapping body parts in the opening between sash and frame may lead to serious injuries.

Gripping between the sash and frame when closing windows and balcony doors poses the risk of crushing injuries.

- ▶ When closing windows and balcony doors, never grip between the sash and frame and always exercise caution.
- ▶ Keep children and anyone unable to understand the risks away from the hazardous area.

Opening and closing sashes improperly poses the risk of injury and property damage.

Incorrect opening and closing of sashes can result in serious injuries and substantial property damage.

- ▶ When moving the sash, ensure that it will not slam against the frame or other sashes once fully opened or closed.
- ▶ Ensure that the sash is slowly guided by hand throughout its entire movement range, until it has been brought into a fully closed or opening position.
- ▶ When closing a sash and locking the hardware, the gasket counter force must be overcome.

Misuse poses a risk of injury and property damage.

Misuse can lead to hazardous situations and may destroy the hardware, frame materials or other individual components within the windows or balcony doors.

- ▶ Do not introduce any obstacles in the opening area between the frame and window or balcony door sashes.
- ▶ Do not place additional loads on windows and balcony door sashes.
- ▶ Refrain from intentionally or uncontrollably slamming or pushing the window or balcony door sash against the window reveal.

Improper maintenance poses the potential risk of injury and property damage.

Windows and balcony doors, including the hardware, require expert maintenance (care, cleaning, maintenance and inspection) in order to guarantee their proper condition and safe use.

- ▶ Keep the hardware free of deposits and contaminants.

- ▶ Carry out care and cleaning tasks as specified in these instructions.
- ▶ Always have regular maintenance, adjustment and repair work carried out by a specialist company.

2.5.3 Ambient conditions

Physical and chemical influences may result in property damage.

Hardware components can be permanently damaged to the point that they can no longer function in a saline, aggressive or corrosive environment.

- ▶ Do not use the hardware components in a saline, aggressive or corrosive environment.
- ▶ Carry out care and cleaning tasks as specified in these instructions.
- ▶ Corrosion protection must be inspected by an authorised specialist company as part of regular maintenance work.

Moisture may cause property damage.

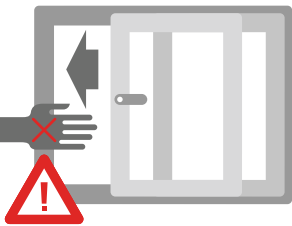
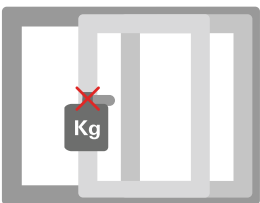
Depending on the outside temperature, relative humidity of the room air and installation conditions for the windows and balcony doors, a temporary build-up of condensation may occur. This can lead to corrosion on the hardware and mould growth on the frame or wall. Ambient conditions that are too damp, particularly during the construction phase, can lead to timber elements warping.

- ▶ Avoid preventing the circulation of air (e.g. due to deep reveals, curtains and unfavourable positioning of heaters or the like).
- ▶ Intensively air out the room several times per day.
 Open all windows and balcony doors for approximately 15 minutes so that the air in the room can be completely replaced.
- ▶ Provide adequate ventilation during holiday periods as well.
- ▶ Create a ventilation plan for construction projects if necessary.

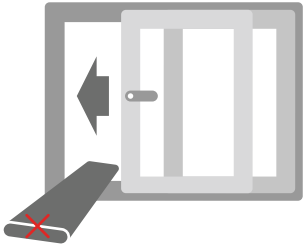
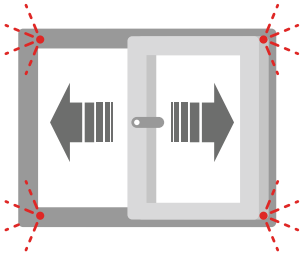
2.6 Operation

The safety symbols and markings and the associated warning instructions explained below apply to the safe operation of windows and balcony doors.

Safety symbols and markings

Symbol	Meaning
	<p>Falls from open windows and balcony doors present an immediate risk of death and pose the risk of serious injuries.</p> <p>Take care when in the vicinity of open windows and balcony doors.</p> <p>Keep children and anyone unable to understand the risks away from the hazardous area.</p>
	<p>Trapping body parts in the opening between sash and frame may lead to serious injuries.</p> <p>When closing windows and balcony doors, never grip between the sash and frame and always exercise caution.</p> <p>Keep children and anyone unable to understand the risks away from the hazardous area.</p>
	<p>Placing additional loads on the sash may lead to minor injuries and property damage.</p> <p>Do not place additional loads on windows and balcony door sashes.</p>



Symbol	Meaning
	<p>Introducing obstacles into the opening between sash and frame may result in minor injuries and property damage.</p> <p>Do not introduce any obstacles in the opening area between the frame and window or balcony door sashes.</p>
	<p>Opening and closing the sash in an uncontrolled manner may result in minor injuries and property damage.</p> <p>Ensure that the sash is slowly guided by hand throughout its entire movement range, until it has been brought into a fully closed or opening position.</p>

3 Information on the product

3.1 General hardware characteristics

- Floating-mullion and connecting-rod hardware with hook
- For slim aluminium profiles
- Suitable for profiles with smooth rebate, Euro-groove or flat Euro-groove
- 90° espagnolette
- Flexibility for custom configurations
- Stable and robust
- Straightforward adjustment options
- Long-term functional performance class H3: 20,000 cycles

Compact espagnolettes

- 1-point locking
- Compact size
- Push-back safeguard and anti-jemmy device integrated as standard

Single-action espagnolettes

- 1-point to 4-point locking, up to 5-point with extension
- Espagnolette support, push-back safeguard and anti-jemmy device integrated as standard
- Adjustable mishandling device with centre fixing
- One-part assembly for simple installation
- Optional screw-on lock casing

Reverse-action espagnolettes

- 2-point to 4-point locking, up to 5-point with extension
- Deflection mechanism for reverse-action locking direction
- Espagnolette support, push-back safeguard and anti-jemmy device integrated as standard
- Adjustable mishandling device with centre fixing
- One-part assembly for simple installation
- Optional screw-on lock casing

3.2 Application ranges

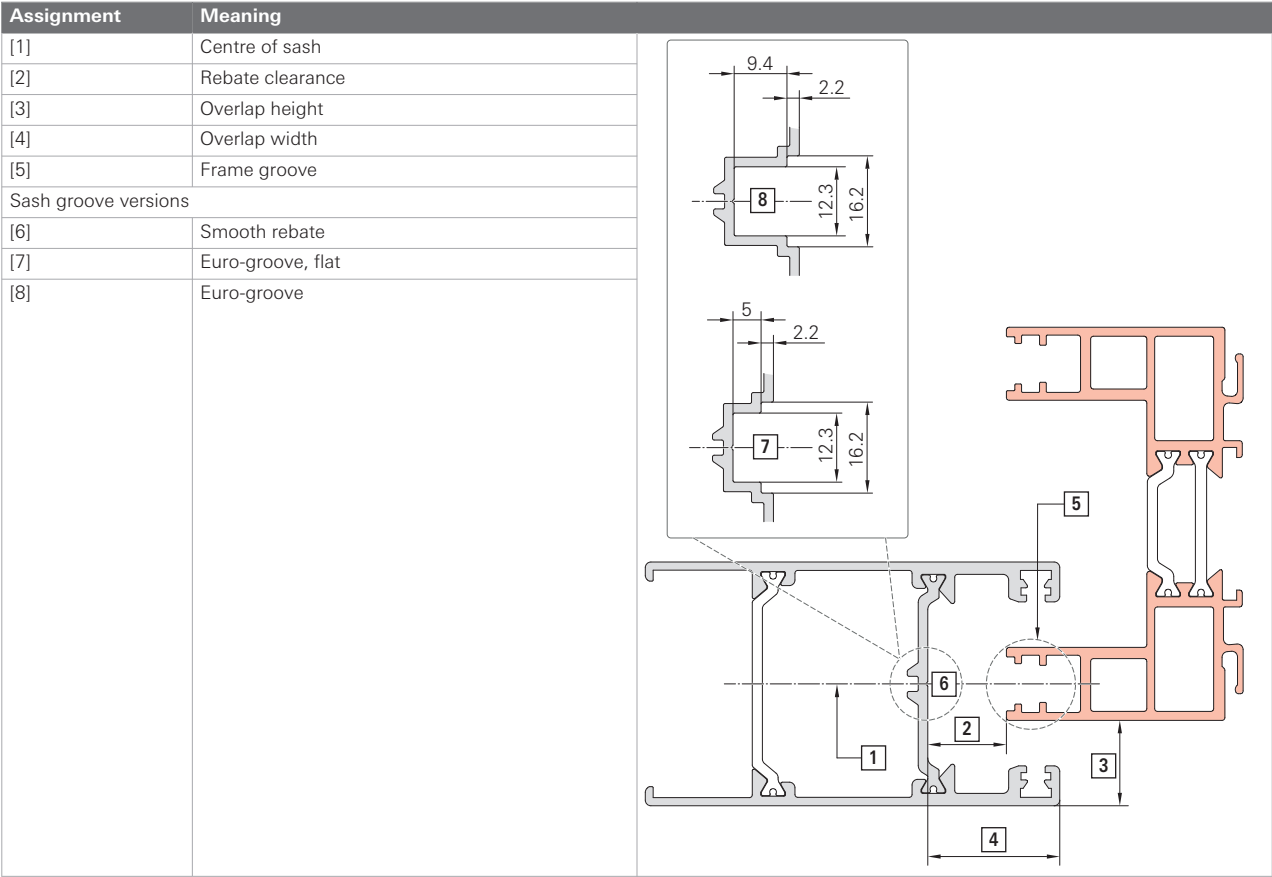
- SW: max. 2000 mm
 - SH: max. 3000 mm
 - S.kg: max. 200 kg
 - SH:SW = max. 2.5:1
- With SW > 900 mm, SH:SW = max. 3:1
- Faceplate width: 16 mm
 - Euro-groove depth: min. 5 mm
 - Rebate clearance:
 - with Euro-groove ≥ 3.5 mm
 - with smooth rebate ≥ 11 mm
 - Backset: 17, 20 and 22 mm
 - Hook length: 7 and 11 mm
 - Extension: 400 mm; on all single-action and reverse-action espagnolettes couplable at the top
 - One adjustable hook above the gearbox from an espagnolette length of 1200 mm
 - Sash arrangement according to diagrams A and D (and others based on diagram A)
 - For handles with 20°, 90° or 180° lock-in position

3.3 Profile cross sections

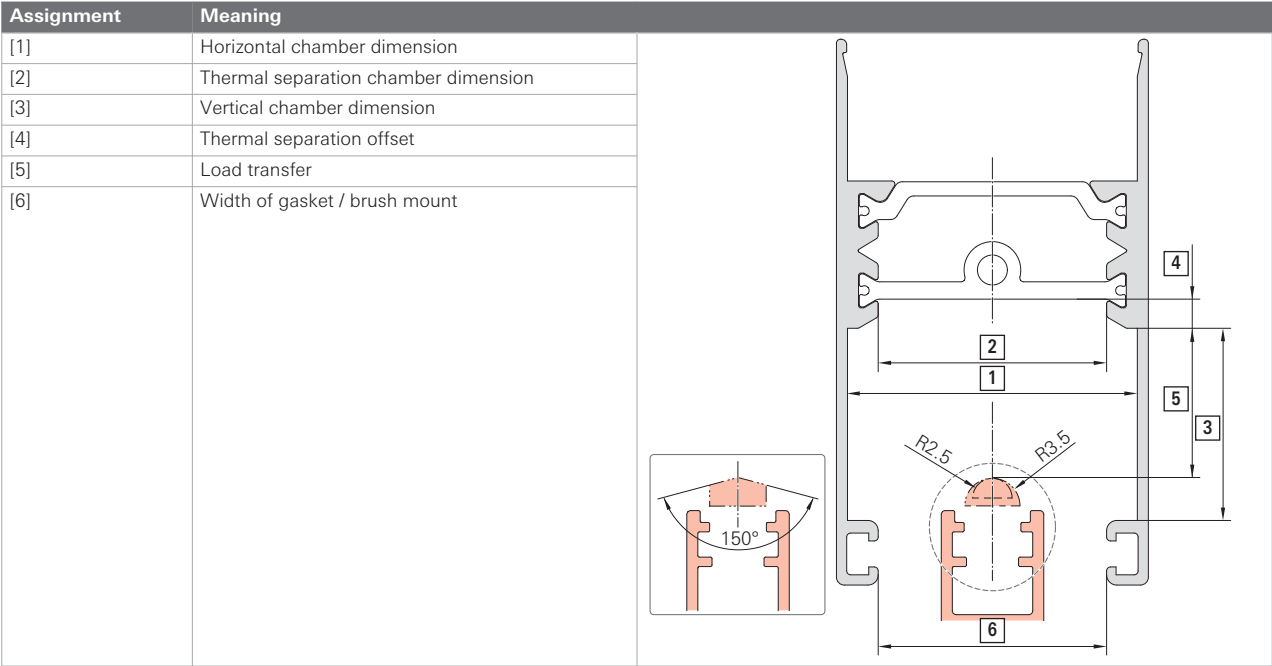
The following drawings show the fundamental requirements that a profile has to meet in order to be compatible with the hardware system.



3.3.1 Horizontal cross section



3.3.2 Vertical cross section



3.4 Profile assessment

Roto generally recommends carrying out profile assessments in the form of theoretical and practical tests. Roto customer service can assist with this upon request.

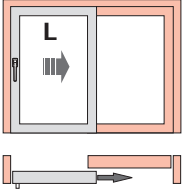
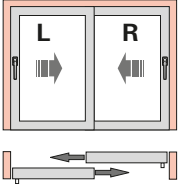
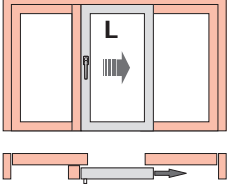
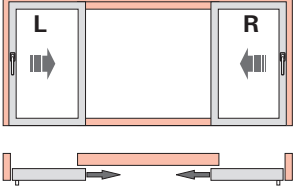
3.5 Design variants

3.5.1 Note regarding the design variants

Combinations for constructing the hardware are assigned to the following diagrams.

These combinations can be built in L and R.

3.5.2 Diagram A

Combinations	Further description
 <p>1 sliding sash (left or right) 1 fixed glazing element</p>	Diagram A
 <p>2 sliding sashes (left and right)</p>	Diagram D
 <p>1 sliding sash (left or right) 2 fixed glazing elements</p>	Diagram G
 <p>2 sliding sashes (left and right) 1 fixed glazing element</p>	Diagram K

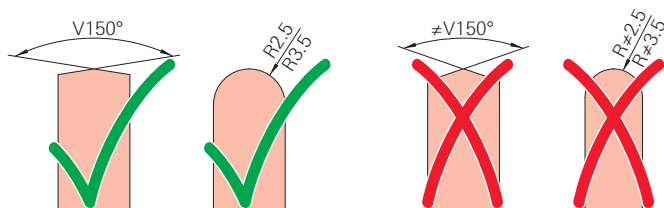
3.6 Dimensions of the roller track



INFO

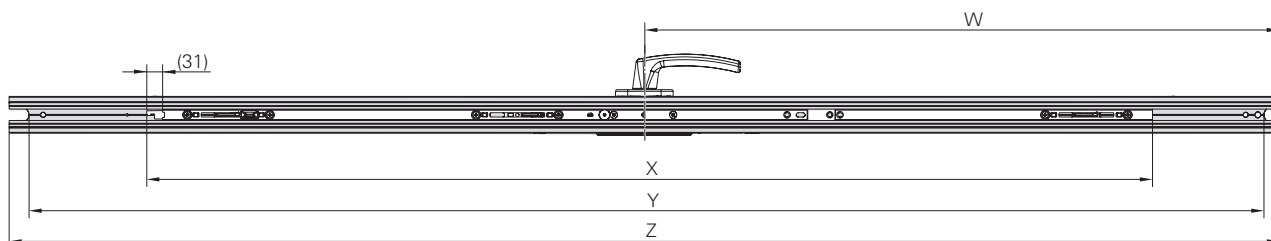
Roller track only made from stainless steel or anodised aluminium.

Roller track shape



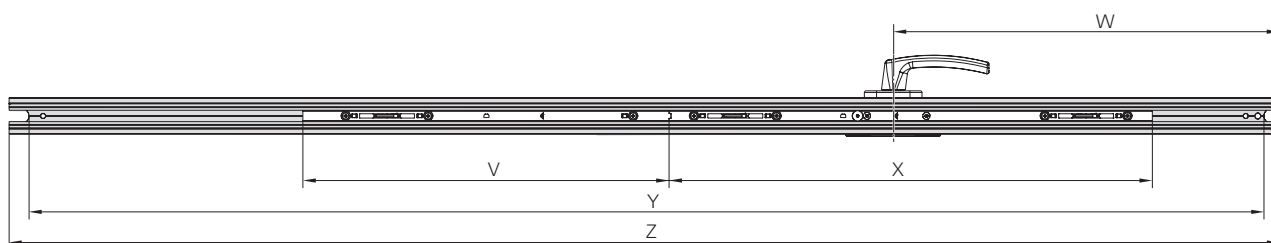
3.7 Espagnolette dimensions

Centred handle height (SH ≤ 2000 mm)



- W Handle height (individual)
- X Length of espagnolette (max. length in locked position)
- Y Max. application range for espagnolettes
- Z Sash height (individual)

Variable handle height



- V Length of extension
- W Handle height (individual)
- X Length of espagnolette - 31 mm (when extension is not mounted)
- Y Max. application range for espagnolettes with extension
- Z Sash height (individual)

4 Hardware overviews

The hardware overviews on the following pages are a recommendation on the part of Roto Frank Fenster- und Tür-technologie GmbH.

The basic page layout in the hardware overviews chapter firstly shows examples of the combination of individual hardware components, and the associated parts list can be seen on the following pages.

The item numbers in the squares link the hardware overview to the parts list.

The actual composition of the hardware depends on:

- the width of the element
- the height of the element
- the weight of the element
- the profile system
- the design variant



INFO

Profile properties

Design the profile optimally for the corresponding weights. Proper load transfer must be ensured by the profile manufacturer / fabricator.

Ensure that the rollers on the roller track run smoothly. Keep the roller track clean, do not powder coat or paint it.

The currently valid Roto profile assessment drawing for the specific profile and the applicable documents described in said drawing must be observed.

Please request these details from your responsible Roto sales representative.

Recommended handles can be found in the Roto Handles catalogue.

Determine the quantity of required hardware components with Roto Con Orders.



INFO

Roto Con Orders

Efficient online hardware configurator for the custom configuration of individual window and door hardware components. All conventional shapes and opening types can be automatically configured quickly and easily. Individual parts lists, including application ranges and an exemplary hardware overview, can be ordered from your responsible sales representative.

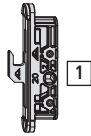
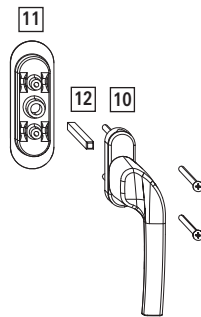
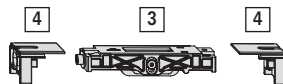
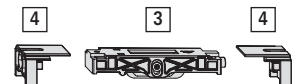


www.roto-frank.com



4.1 Diagrams A and D

4.1.1 Compact espagnolettes





Application range

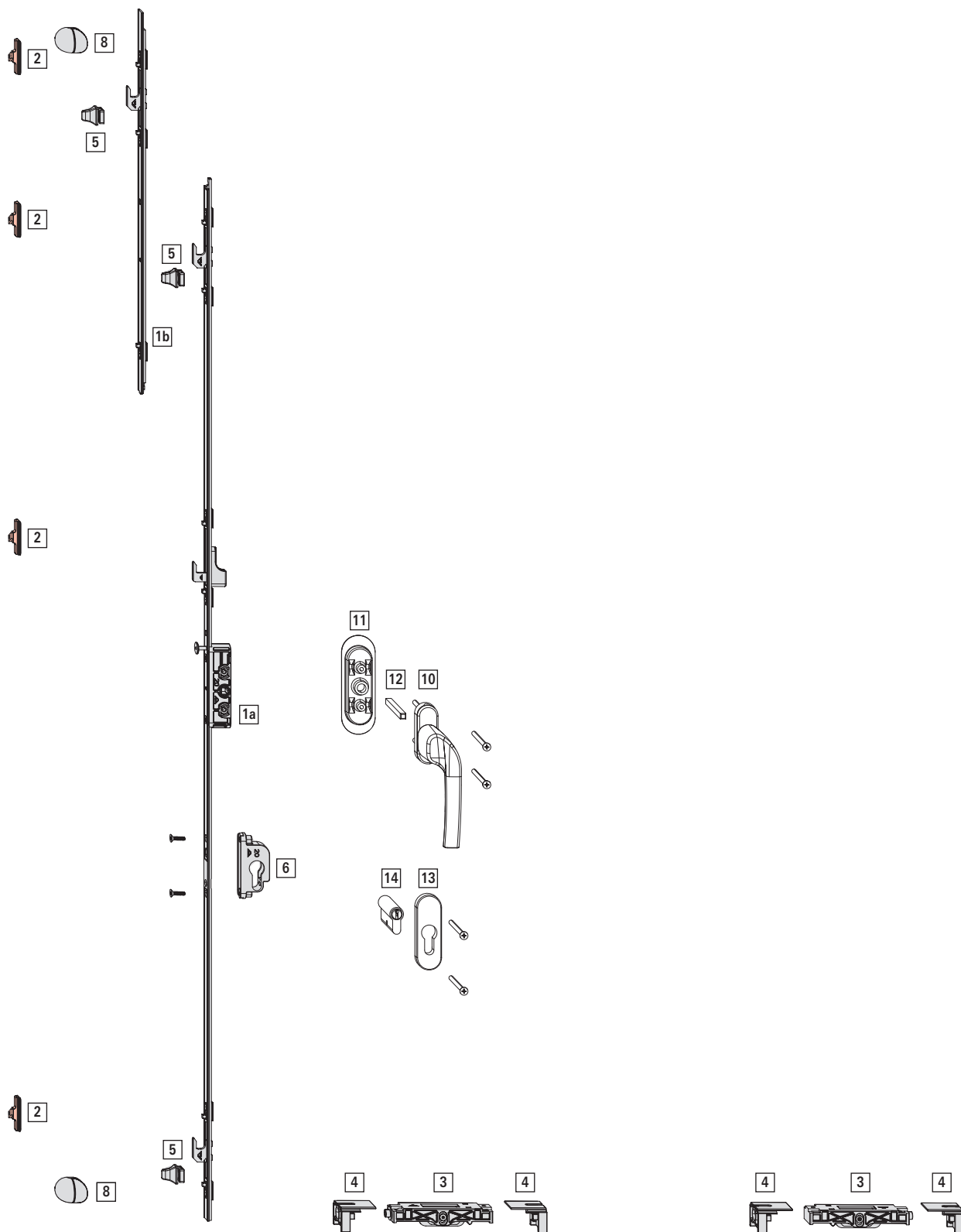
S.kg: max. 200 kg

SW: 500 – 2000 mm

SH: 200 – 3000 mm

Item	Description	
Espagnolette		
[1]	Compact with hook	→ from page 34
Locking components		
[2]	Striker	→ from page 39
Roller unit		
[3]	Tandem roller unit	→ from page 37
[4]	Adapter	→ from page 38
Handles		
[10]	Interior handle: Roto Line cranked	→ CTL_1
	Alternatively: Roto Freestyle pop-up	
[11]	Exterior handle: Roto Line recessed grip, routed (mat. no. 783552) (mandatory in conjunction with pop-up)	
[12]	Accessory box with square spindle	→ CTL_1
Accessories		
[8]	Stop part set	→ from page 41

4.1.2 Single-action espagnolettes





Application range

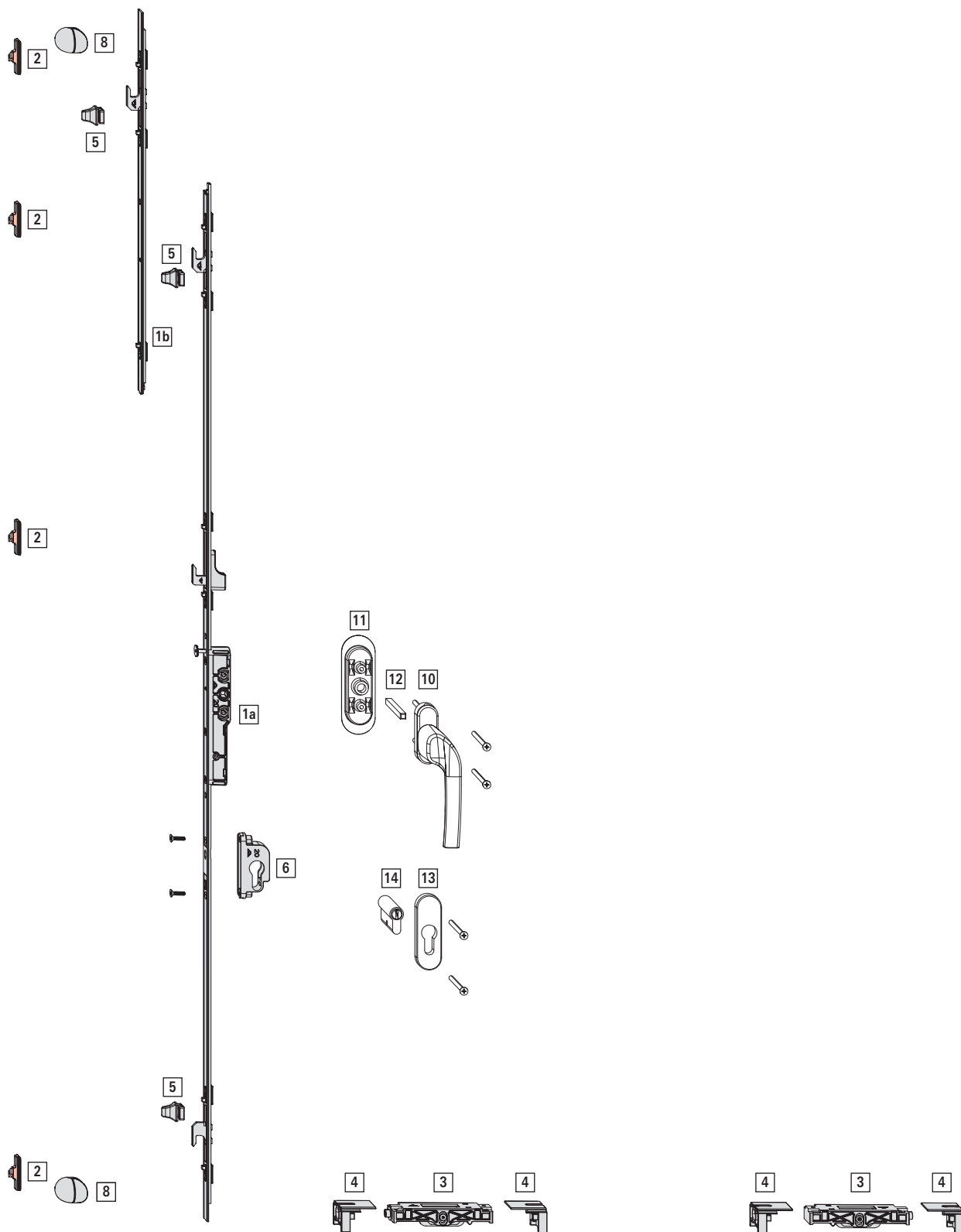
S.kg: max. 200 kg

SW: 500 – 2000 mm

SH: 240 – 3000 mm

Item	Description	
Espagnolette		
[1a]	Single-action with hook and mishandling device	→ from page 34
[1b]	Extension with hook	→ from page 35
Locking components		
[2]	Strikers	→ from page 39
Roller unit		
[3]	Tandem roller unit	→ from page 37
[4]	Adapter	→ from page 38
Handles		
[10]	Interior handle: Roto Line cranked	→ CTL_1
	Alternatively: Roto Freestyle pop-up	
[11]	Exterior handle: Roto Line recessed grip, routed (mat. no. 783552) (mandatory in conjunction with pop-up)	
[12]	Accessory box with square spindle	→ CTL_1
[13]	Roto Line profile cylinder escutcheon	→ CTL_1
[14]	Profile cylinder	→ CTL_86
Accessories		
[5]	Centring aid set (for espagnolettes > 600 mm)	→ from page 40
[6]	Lock casing with screws (for espagnolettes > 800 mm)	→ from page 40
[8]	Stop part set	→ from page 41

4.1.3 Reverse-action espagnolettes





Application range

S.kg: max. 200 kg

SW: 500 – 2000 mm

SH: 600 – 3000 mm

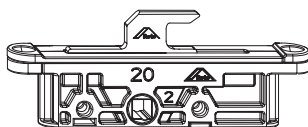
Item	Description	
Espagnolette		
[1a]	Reverse-action with hook and mishandling device	→ from page 35
[1b]	Extension with hook	→ from page 35
Locking components		
[2]	Strikers	→ from page 39
Roller unit		
[3]	Tandem roller unit	→ from page 37
[4]	Adapter	→ from page 38
Handles		
[10]	Interior handle: Roto Line cranked	→ CTL_1
	Alternatively: Roto Freestyle pop-up	
[11]	Exterior handle: Roto Line recessed grip, routed (mat. no. 783552) (mandatory in conjunction with pop-up)	
[12]	Accessory box with square spindle	→ CTL_1
[13]	Roto Line profile cylinder escutcheon	→ CTL_1
[14]	Profile cylinder	→ CTL_86
Accessories		
[5]	Centring aid set (for espagnolettes > 600 mm)	→ from page 40
[6]	Lock casing with screws (for espagnolettes > 800 mm)	→ from page 40
[8]	Stop part set	→ from page 41

5 Espagnolettes

5.1 Compact

5.1.1 with 1-point locking

incl. push-back safeguard and anti-jemmy device



	#		Nº
17	1	7	2031737
	1	11	2031754
20	1	7	2031761
	1	11	2031768
22	1	7	2031776
	1	11	2031783

5.2 Single-action

5.2.1 with 1-point to 4-point locking

incl. push-back safeguard and anti-jemmy device; with espagnolette support and mishandling device; couplable at the top



		#			Nº
17	240	1	7	–	2031738
	400	2	7	–	2031749
	600	2	7	–	2031750
	800	2	7	–	2031751
	1200	3	7	1 hook, adjustable, above gearbox	2031752
	1800	4	7	1 hook, adjustable, above gearbox	2031753
	240	1	11	–	2031755
	400	2	11	–	2031756
	600	2	11	–	2031757
	800	2	11	–	2031758
	1200	3	11	1 hook, adjustable, above gearbox	2031759
	1800	4	11	1 hook, adjustable, above gearbox	2031760
20	240	1	7	–	2031762
	400	2	7	–	2031763
	600	2	7	–	2031764
	800	2	7	–	2031765
	1200	3	7	1 hook, adjustable, above gearbox	2031766
	1800	4	7	1 hook, adjustable, above gearbox	2031767
	240	1	11	–	2031769
	400	2	11	–	2031770
	600	2	11	–	2031771
	800	2	11	–	2031772
	1200	3	11	1 hook, adjustable, above gearbox	2031773
	1800	4	11	1 hook, adjustable, above gearbox	2031774



					Nº
22	240	1	7	–	2031777
	400	2	7	–	2031778
	600	2	7	–	2031779
	800	2	7	–	2031780
	1200	3	7	1 hook, adjustable, above gearbox	2031781
	1800	4	7	1 hook, adjustable, above gearbox	2031782
	240	1	11	–	2031784
	400	2	11	–	2031785
	600	2	11	–	2031786
	800	2	11	–	2031787
	1200	3	11	1 hook, adjustable, above gearbox	2031788
	1800	4	11	1 hook, adjustable, above gearbox	2031789

5.3 Reverse-action

5.3.1 with 2-point to 4-point locking

incl. push-back safeguard and anti-jemmy device; with espagnolette support and mishandling device; couplable at the top



					Nº
17	600	2	7	–	2031790
	800	2	7	–	2031791
	1200	3	7	1 hook, adjustable, above gearbox	2031792
	1800	4	7	1 hook, adjustable, above gearbox	2031793
	600	2	11	–	2031794
	800	2	11	–	2031795
	1200	3	11	1 hook, adjustable, above gearbox	2031796
	1800	4	11	1 hook, adjustable, above gearbox	2031798
20	600	2	7	–	2031799
	800	2	7	–	2031800
	1200	3	7	1 hook, adjustable, above gearbox	2031801
	1800	4	7	1 hook, adjustable, above gearbox	2031802
	600	2	11	–	2031803
	800	2	11	–	2031806
	1200	3	11	1 hook, adjustable, above gearbox	2031807
	1800	4	11	1 hook, adjustable, above gearbox	2031808
22	600	2	7	–	2031809
	800	2	7	–	2031810
	1200	3	7	1 hook, adjustable, above gearbox	2031811
	1800	4	7	1 hook, adjustable, above gearbox	2031812
	600	2	11	–	2031813
	800	2	11	–	2031814
	1200	3	11	1 hook, adjustable, above gearbox	2031815
	1800	4	11	1 hook, adjustable, above gearbox	2031816

5.4 Extensions

5.4.1 with hook



Espagnolettes
Extensions
with hook

			Nº
400	1	7	2031821
	1	11	2031822



6 Roller unit

6.1 Tandem roller unit, adjustable height

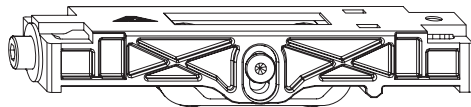


INFO

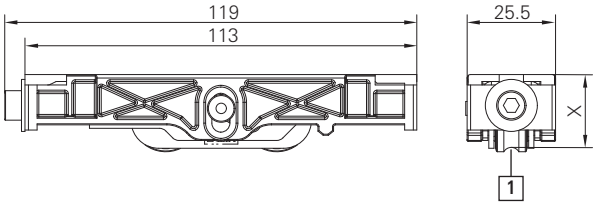
Pay attention to the profile assessment.

Housing made from POM, roller unit made from steel

Version 1



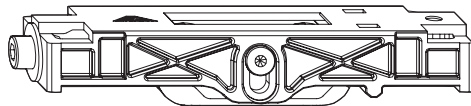
Height 19 to 25 mm (delivery state 21 mm)



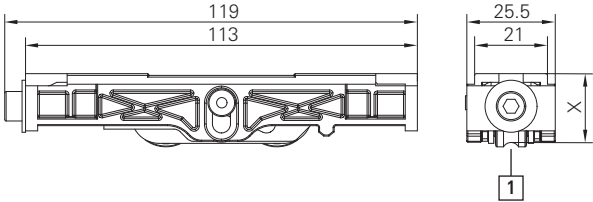
X = height in delivery state; [1] = track shape

					Nº
21	119	25.5	For 150° V track	200 kg	2040231
			For R2.5 round track	200 kg	2040232
			For R3.5 round track	200 kg	2040233

Version 2



Height 19.9 to 25.9 mm (delivery state 19.9 mm)



X = height in delivery state; [1] = track shape

					Nº
19.9	119	25.5	For 150° V track	200 kg	2043492
			For R2.5 round track	200 kg	2043493



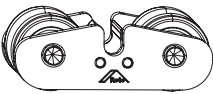
INFO

Functional durability in accordance with DIN EN 13126 part 15: class H3.

Corrosion resistance in accordance with DIN EN 1670: class 5.

Roller assembly

Replacement rollers for all roller units.



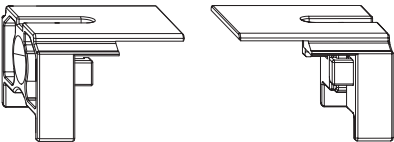
	Nº
For 150° V track	2043370
For R3.5 round track	2043371



INFO

Both material numbers can be used for round track $\geq R2.5$.

6.2 Adapters for roller units



			Nº
C101	36.8	2 Piece(s)	2043348
C103	30.5	2 Piece(s)	2040239
C106	28.8	2 Piece(s)	2043539
C107	36.6	2 Piece(s)	2043540
C108	33.7	2 Piece(s)	2043541



7 Locking components

7.1 Striker

INFO

Order strikers depending on the profile used (see profile assessment).

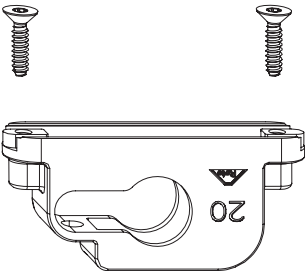


			Nº
Clampable		K101	2046273
		K106	2046274
		K107	2046275
Screw-on		S103	2046269
		S108	2046272
Slide-in		E103	2046931
		E113	2046930

8 Accessories

8.1 Lock casing

Optional for espagnolettes from a length of 800 mm.



				Nº
17 20	2	WPT 4x16	Grey	2031819
22	2	WPT 4x16	Grey	2031820

8.2 Centring aid set

Can optionally be used on each hook (except for the adjustable hook) for espagnolettes from a length of 600 mm.



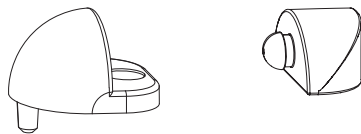
Set consisting of: 1 centring component, 1 centring plate, 1 screw

				Nº
for hook height 7	Z103	1	WPT 3x10	2043044
for hook height 11	Z101	1	WPT 3x10	2031817
	Z102	1	WPT 3x10	2031818



8.3 Stop part set

Stop part set



Set consisting of: 1 stop part, 1 rubber part

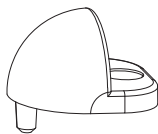


INFO

Screws are not included in the scope of delivery.

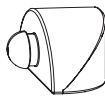
			Nº
R01.11	RAL 9006	White aluminium	449963
R02.1	RAL 7011	Iron grey	2003087
R04.1	RAL 8019	Grey brown	317251
R06.2	RAL 9005	Jet black	335555
R06.2M	RAL 9005M	Jet black, matt	834258
R07.2	RAL 9016	Traffic white	317250

Stop part for users who intend to paint the component themselves



		Nº
R00.0	Uncoated	317249

Rubber part

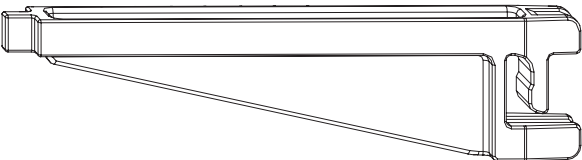


		Nº
R06.2	Jet black	317252

9 Jigs / tools

9.1 Installation jig

For positioning strikers, suitable for espagnolettes with 7 mm or 11 mm hook



	Nº
7	2048609
11	2048608

9.2 Hex key

		Nº
Hex key size 2.5 / 4	–	230764
Hex key size 4	150	812337

10 Profile systems



INFO

The profiles shown in the overview are an excerpt from the profile assessments. Other profiles are available upon request.

Abbreviation	Meaning	Abbreviation	Meaning
DM/VA	Espagnolette backset / locking version H7/11 = with hook 7 / 11 mm	H/S	Height / track shape R2.5 = round track R2.5; R3.5 = round track R3.5; V150° = V-track 150°
M	Installation type K = clampable; S = screw-on; E = slide-in		

10.1 Component selection

Profile system		Espagnolette	Centring aid	Roller unit		Strikers
				Tandem	Adapter	
Manufacturer	Series	DM/VA		H/S		M
AluK	67CL32	20/H11	Z101	21/V150° 21/R2.5	C101	K101
Profils Systèmes	Cuzco® Series 712	20/H7	Z103	19.9/R2.5	C106	K106
Reynaers	SlimPatio 68	20/H11	Z102	19.9/R2.5	C103	S103 E103
Schüco	ASS 41 SC	20/H7	Z103	21/V150°	C108	S108
Wicona	WICSLIDE 65	20/H11	Z101	21/R3.5	C107	K101

11 Installation

11.1 Processing instructions

Maximum sash sizes and weights

The specifications, application diagrams and component assignments which can be found in the hardware manufacturer's product-specific documents provide information on the maximum permitted sash sizes and weights. The component with the lowest permitted load bearing capacity determines the maximum permitted sash weight.

- Before using electronic data records and implementing them in window fabrication programs in particular, check that they match the specifications, application diagrams and component assignments.
- Never exceed the maximum permitted sash sizes and weights. If any points are unclear, contact the hardware manufacturer.

Specifications from profile manufacturers

The element manufacturer must comply with all specified system dimensions (e.g. gasket gap dimensions or locking distances).

They must continue to ensure and check this on a regular basis, especially when new hardware components are used for the first time, during production and on a continuous basis, up to and including element installation.



INFO

The hardware components are always designed in such a way that any system dimensions affected by the hardware can be adjusted. The hardware manufacturer shall not be liable for any additional expenses incurred if a deviation from these dimensions is not discovered until after the element has been installed.

Combining hardware

Burglar inhibiting elements need hardware which meets special requirements.

Elements for wet rooms and those for use in environments with aggressive, corrosive constituents in the air require hardware that meets special requirements.

The resistance of elements to wind loads when they are closed and locked depends on the individual design of the element. The hardware system is capable of handling wind loads specified by legislation and standards (for example in accordance with EN 12210 – especially test pressure P3).

Coordinate suitable hardware combinations and installation procedures in elements with the hardware manufacturer and profile manufacturer for the areas listed above, and conclude a separate agreement for them.



INFO

The hardware manufacturer's specifications on the combination of hardware (e.g. the use of additional scissor stays, the design of hardware for burglar-inhibiting elements, etc.) are binding.

Installation surfaces

The frame and sash grooves must be free from construction materials (such as plaster, gypsum). The sash groove must be free from welding residue to ensure an optimum supporting surface for the hardware components.

Specifications relating to installation and care



ATTENTION

Sealing compounds that contain silicone may cause property damage.

Sealing compounds that contain silicone may considerably reduce the sealing effect near the threshold after three to five years.

- ▶ Only use silicone-free sealing compounds to seal the threshold.

Remove excess sealing compound after installation.



ATTENTION

Using incorrect cleaning agents and sealing compounds may cause property damage.

Cleaning agents and sealing compounds may damage the surfaces of components and gaskets.

- ▶ Do not use aggressive or flammable liquids, acidic cleaners or abrasive cleaners.
- ▶ Only use mild, pH-neutral cleaning agents that have been diluted.
- ▶ Apply a thin protective film to the components, for example using a cloth soaked in oil.
- ▶ Avoid aggressive vapours (e.g. produced by formic acid, acetic acid, ammonia, amine compounds, ammonia compounds, aldehyde, carbolic acid, chlorine, tannic acid) around the element.
- ▶ Do not use any acetic acid-crosslinking or acid-crosslinking sealing compounds or those with the aforementioned constituents as both direct contact with the sealing compound and its fumes can corrode the surface of the components.

11.2 Screw connections



DANGER

Incorrectly installed or screwed-in hardware components present a risk of death.

Incorrectly installed and screwed-in hardware components may lead to hazardous situations and cause serious or fatal accidents.

- ▶ During installation and screwdriving work, observe the specifications provided by the profile manufacturer; contact the profile manufacturer if necessary.
- ▶ Use the recommended screws.
- ▶ Select the length of the screws according to the profiles used.
- ▶ Ensure that the hardware components are adequately secured; contact the screw manufacturer if necessary.



ATTENTION

Using incorrect screw material may cause property damage.

Using the wrong screws may damage the components.

- ▶ Only use galvanised zinc-plated and passivated steel screws.
- ▶ Use screws with additional sealing in more challenging climatic conditions.
- ▶ Use stainless-steel screws on stainless-steel components only.
- ▶ For aluminium components, use screws made of steel (coated with zinc-nickel or zinc flakes) or stainless steel.



ATTENTION

Improper screw fixings may cause property damage.

Improper screw fixings may damage the components and the element as a whole, and stop them from working properly.

- ▶ Unless stated otherwise, turn screws in straight.
- ▶ Tighten screw heads until they are flush with the surface.
- ▶ Do not over-tighten screws. Note the torque. Choose a torque that will not deform the hardware and profile. Define profile-specific torques on the basis of the demo assembly.
- ▶ Use the recommended screws.
- ▶ Select the length of the screws according to the profiles used.

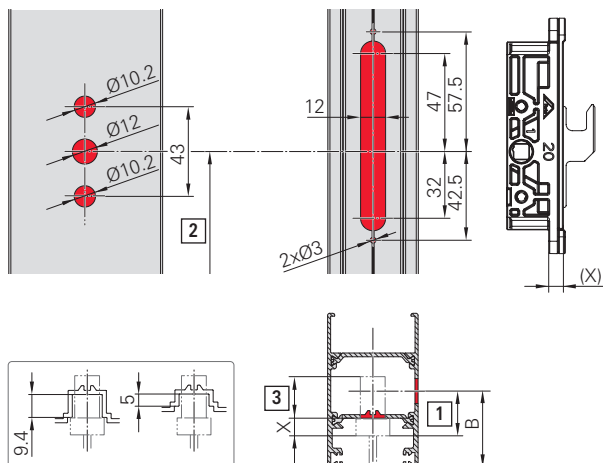
11.2.1 Overview

Components	Quantity	Size	Diameter to be drilled	Drive	Screw head diameter
Roller unit	1	ST3.9 – 4.1 x ...	3.0	Not specified	≥ 6.9 to ≤ 8.0
Striker	1	ST3.5 x ...	3.0	Not specified	≥ 6.9 to ≤ 8.0
Interior handle: Roto Line cranked	2	M5 x ...	3.0	Cross-head	–

11.3 Drilling and routing dimensions

11.3.1 Compact espagnolettes

Not lockable



[1] Backset (BS)

[B] Drilling dimension for square spindle (see profile assessment)

[X]:

- BS 17 = 10 mm
- BS 20 / 22 = 7 mm

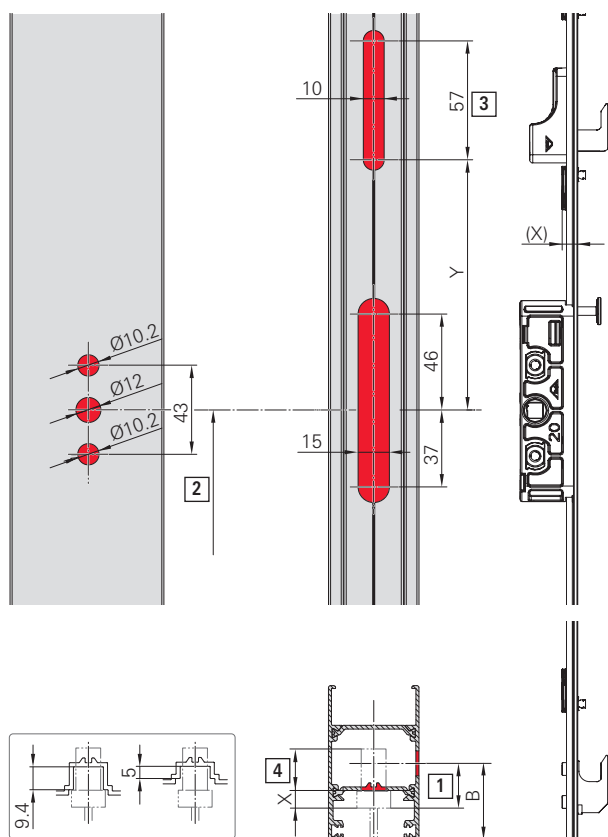
[2] Handle height

[3] Routing depth of espagnolette:

- BS 17 = 18 mm
- BS 20 = 21 mm
- BS 22 = 23 mm

11.3.2 Single-action espagnolettes

Not lockable



[1] Backset (BS)

[B] Drilling dimension for square spindle (see profile assessment)

[X]:

- BS 17 = 10.3 mm
- BS 20 / 22 = 7.3 mm

[2] Handle height

[3] From espagnolette length of 1200 mm: routing for adjustable hook

[Y] Hook, adjustable:

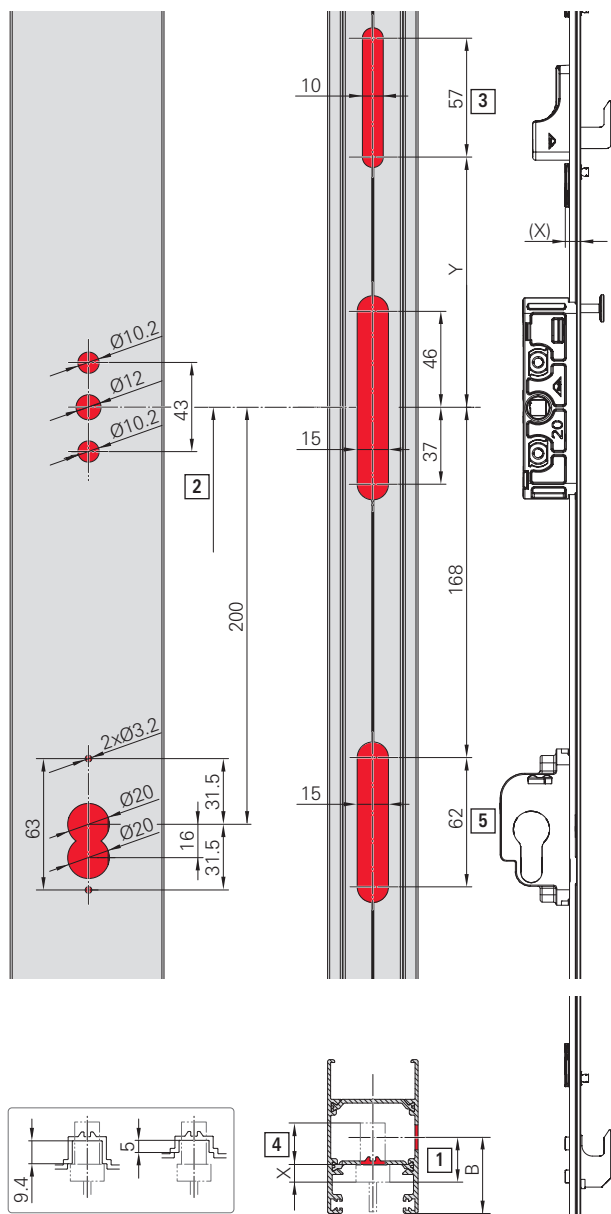
- Espagnolette length 1200 = 120 mm
- Espagnolette length 1800 = 312 mm

[4] Espagnolette routing depth / hook, adjustable:

- BS 17 = 18 mm
- BS 20 = 21 mm
- BS 22 = 23 mm



Lockable



[1] Backset (BS)

[B] Drilling dimension for square spindle (see profile assessment)

[X]:

- BS 17 = 10.3 mm
- BS 20 / 22 = 7.3 mm

[2] Handle height

[3] From espagnolette length of 1200 mm: routing for adjustable hook

[Y] Hook, adjustable:

- Espagnolette length 1200 = 120 mm
- Espagnolette length 1800 = 312 mm

[4] Espagnolette routing depth / hook, adjustable:

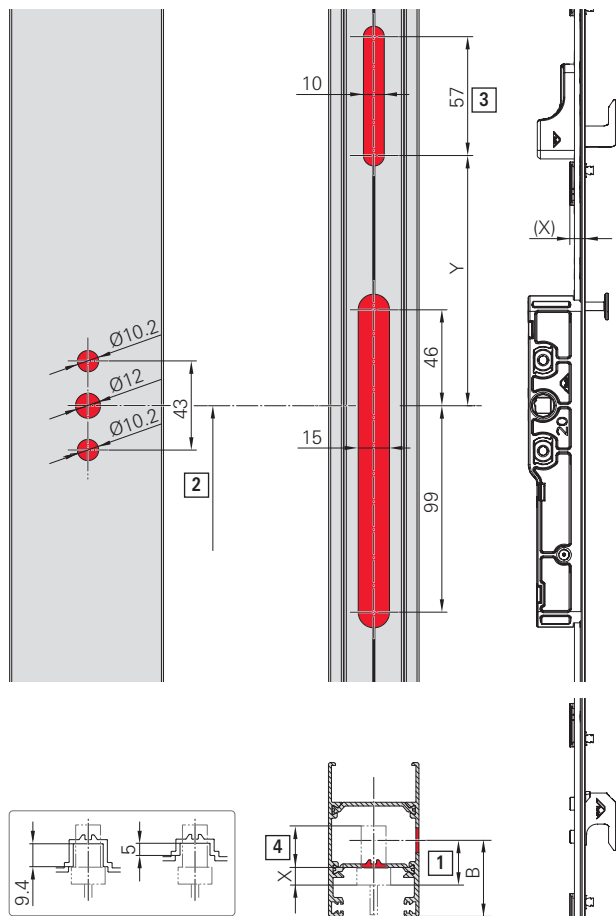
- BS 17 = 18 mm
- BS 20 = 21 mm
- BS 22 = 23 mm

[5] Lock casing routing depth:

- BS 17 = 26 mm
- BS 20 = 29 mm
- BS 22 = 31 mm

11.3.3 Reverse-action espagnolettes

Not lockable



[1] Backset (BS)

[B] Drilling dimension for square spindle (see profile assessment)

[X]:

- BS 17 = 10.3 mm
- BS 20 / 22 = 7.3 mm

[2] Handle height

[3] From espagnolette length of 1200 mm: routing for adjustable hook

[Y] Hook, adjustable:

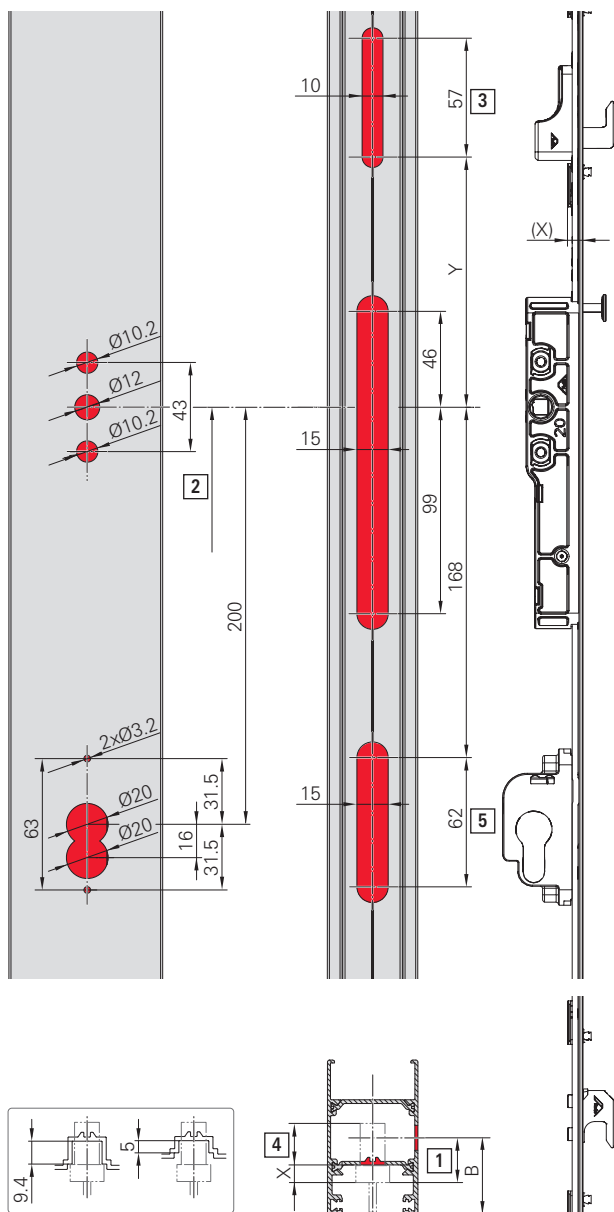
- Espagnolette length 1200 = 120 mm
- Espagnolette length 1800 = 312 mm

[4] Espagnolette routing depth / hook, adjustable:

- BS 17 = 18 mm
- BS 20 = 21 mm
- BS 22 = 23 mm



Lockable



[1] Backset (BS)

[B] Drilling dimension for square spindle (see profile assessment)

[X]:

- BS 17 = 10.3 mm
- BS 20 / 22 = 7.3 mm

[2] Handle height

[3] From espagnolette length of 1200 mm: routing for adjustable hook

[Y] Hook, adjustable:

- Espagnolette length 1200 = 120 mm
- Espagnolette length 1800 = 312 mm

[4] Espagnolette routing depth / hook, adjustable:

- BS 17 = 18 mm
- BS 20 = 21 mm
- BS 22 = 23 mm

[5] Lock casing routing depth:

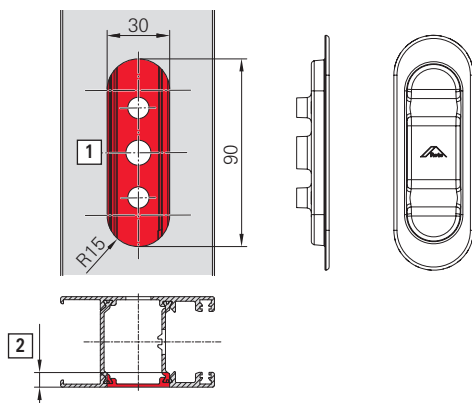
- BS 17 = 26 mm
- BS 20 = 29 mm
- BS 22 = 31 mm

11.3.4 Recessed grip



INFO

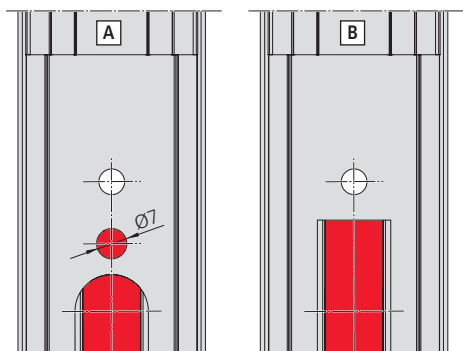
Pay attention to the profile assessment.



[1] Centre of square spindle

[2] Routing depth: 7 mm

11.3.5 Roller unit



Recesses (profile-related) for the movement of the sash and adjustment of the roller unit

Version [A]: min. recess for movement and drill hole for roller unit adjusting screw through all walls.

Version [B]: recess for movement and roller unit adjusting screw through all walls.

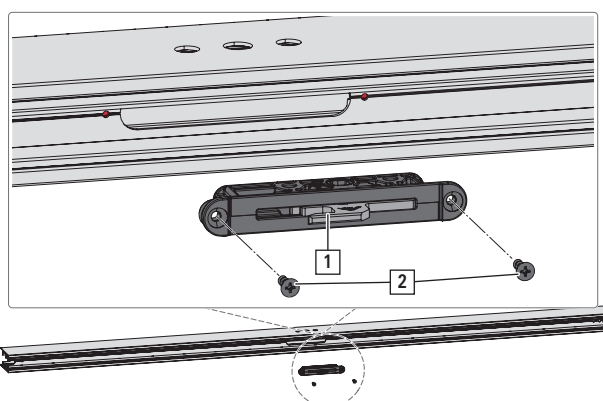
11.4 Sash

11.4.1 Espagnolettes and accessories

11.4.1.1 Compact espagnolettes

Installing the espagnolette

1. Insert the espagnolette so that the open side of the hook [1] points upwards on the vertical element.
 Fasten with two screws [2].





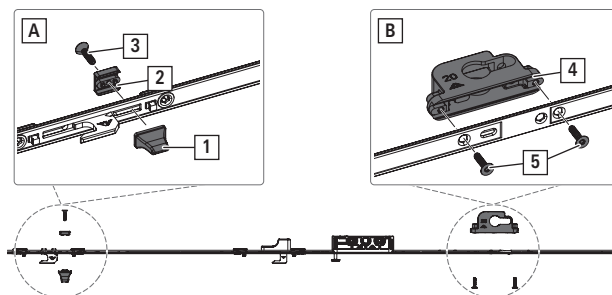
11.4.1.2 Single-action / reverse-action espagnolettes

Preassembling the espagnolette

1. Optional:

From an espagnolette length of 600 mm, fasten the top part [1] and bottom part [2] of the centring aid with the one screw [3] supplied [A]. A centring aid can be positioned behind each hook (except for the adjustable hook).

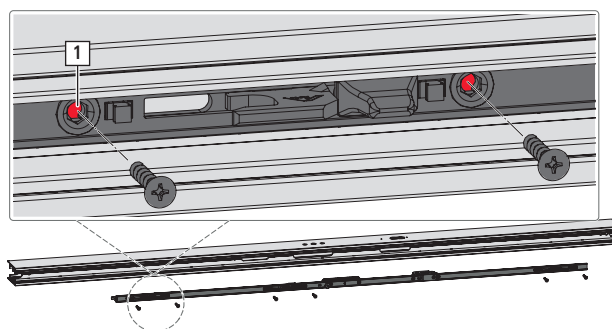
From an espagnolette length of 800 mm, fasten the lock casing [4] with the two screws [5] supplied [B].



Installing the espagnolette

⇒ Optional components are preassembled.

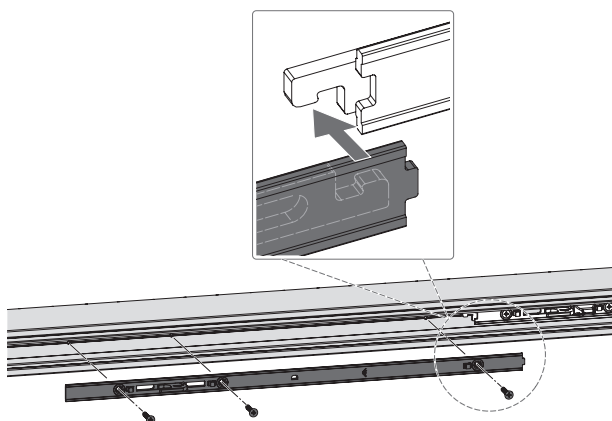
1. Insert the espagnolette, align it parallel to the profile and fasten it with screws at all screw positions [1].



2. Size-dependent:

Install a maximum of one extension at the top of the espagnolette. Create a form-fitting connection and align it parallel to the profile.

Fasten with three screws.



11.4.2 Handles

Roto Line cranked

Installing the handle

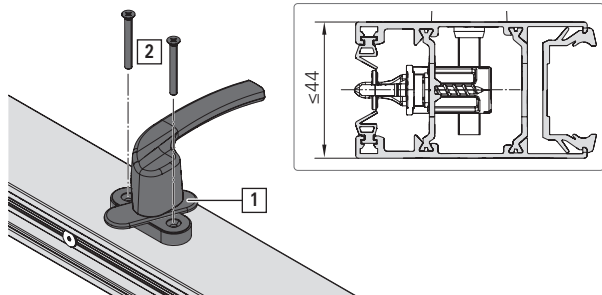
⇒ Profile width max. 44 mm.

⇒ Espagnolette installed in centre of sash groove.

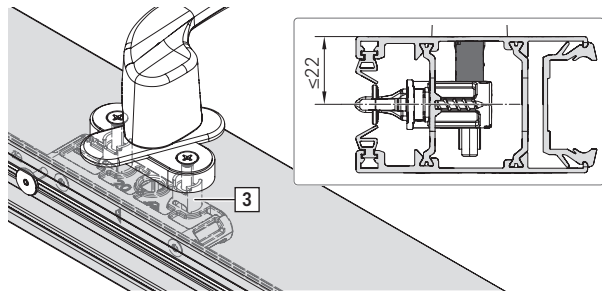
⇒ Optional: espagnolette with lock casing installed.

1. Move the handle to the sliding position.
2. Turn the escutcheon cover [1] in order to expose the screw holes.

3. Insert the handle into the sash.
4. Fasten the handle in the espagnolette with two screws [2].



5. Single-action and reverse-action espagnolettes:
 Screw the espagnolette support [3] into place.
 Once it has been screwed in as far as possible [4],
 the espagnolette support [3] will be positioned
 against the profile wall.

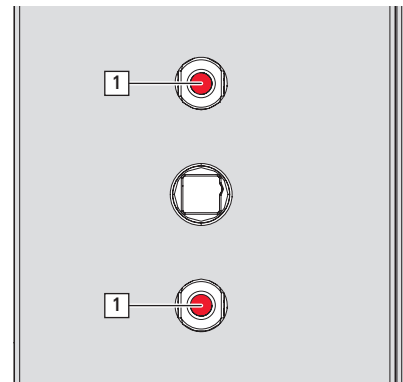


6. Turn the escutcheon cover in order to cover the
 screw holes.

Roto Line cranked with Roto Line recessed grip and Roto Line profile cylinder escutcheon

Drilling out the espagnolette

1. Drill out the espagnolette at the screw positions
 for the handle with $\varnothing 5$ so that the recessed grip
 and handle can be screwed together.

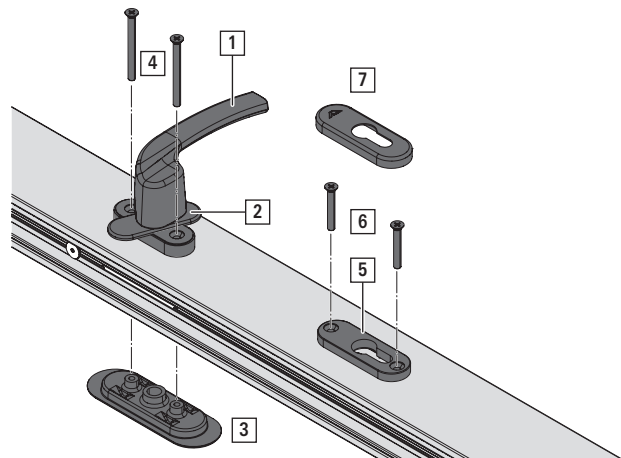




Installing the handle, recessed grip and profile cylinder escutcheon

⇒ Optional: espagnolette with lock casing installed.

1. Move the handle [1] to the sliding position → *from page 62*.
2. Turn the escutcheon cover [2] in order to expose the screw holes.
3. Insert the handle into the sash.
4. Insert the recessed grip [3] into the sash on the opposite side.
5. Screw the recessed grip through the handle with two screws [4].
6. Turn the escutcheon cover in order to cover the screw holes.
7. Position the profile cylinder escutcheon [5] on the inside and fasten with two screws [6].
8. Attach the cover cap [7] to the profile cylinder escutcheon.

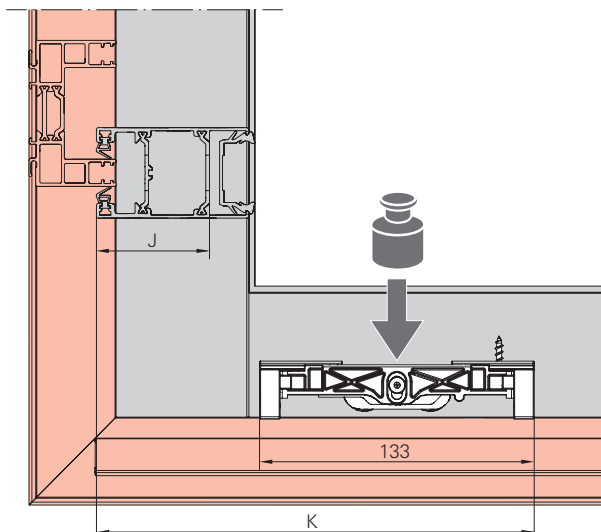


11.4.3 Roller unit

Positioning glazing blocks

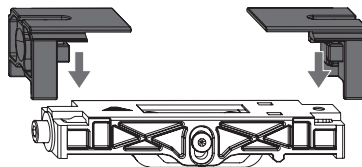
⇒ The spacer blocking specifications from the profile manufacturer have been adhered to.

1. Determine the glazing block position (= roller unit position): $K = J + 153$



Connecting the adapters (profile-related) to the roller unit

1. Attach the profile-related adapters to the front and rear of the roller unit.



Installing the roller units

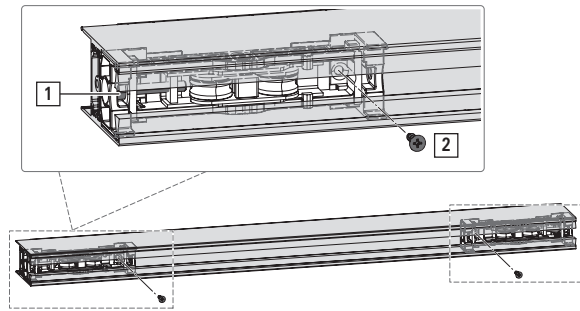
⇒ Sash profile pieces are cut to size, routed and predrilled but not yet assembled.

Installation

Frame

Screwing the sash profile pieces together

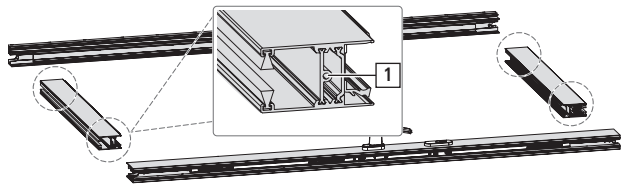
1. Slide in both roller units into the bottom sash profile so that the adjusting screw [1] faces outwards. Position one roller unit at the end of each side, observing the profile guidelines while doing so. Fasten each roller unit with one screw [2]. Fully countersink the screw head.



11.4.4 Screwing the sash profile pieces together

⇒ Sash profile preassembled with all components.

1. Place the sash profiles edge to edge so that they are flush and screw them together at the screw-fixing point [1] in accordance with the specifications of the profile manufacturer.



11.5 Frame

11.5.1 Locking components

11.5.1.1 Striker position for compact espagnolettes

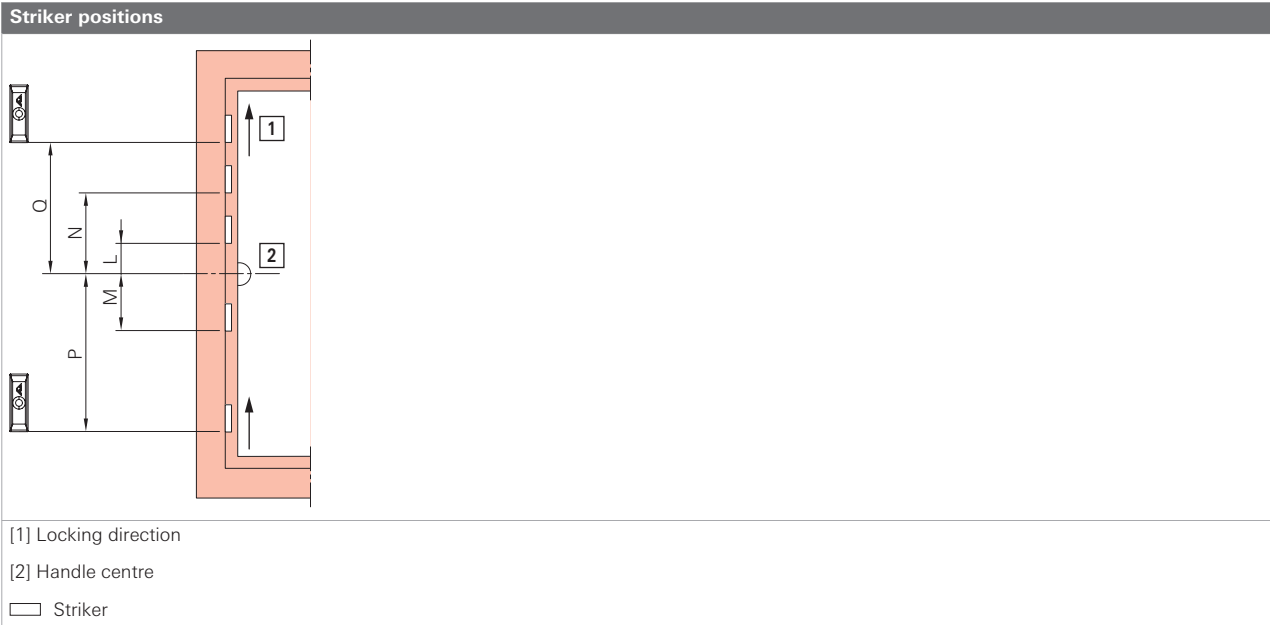
Striker position

[1] Locking direction
[2] Handle centre
□ Striker

Length of espagnolette	Number of hooks (espagnolette)	A
112	1	31

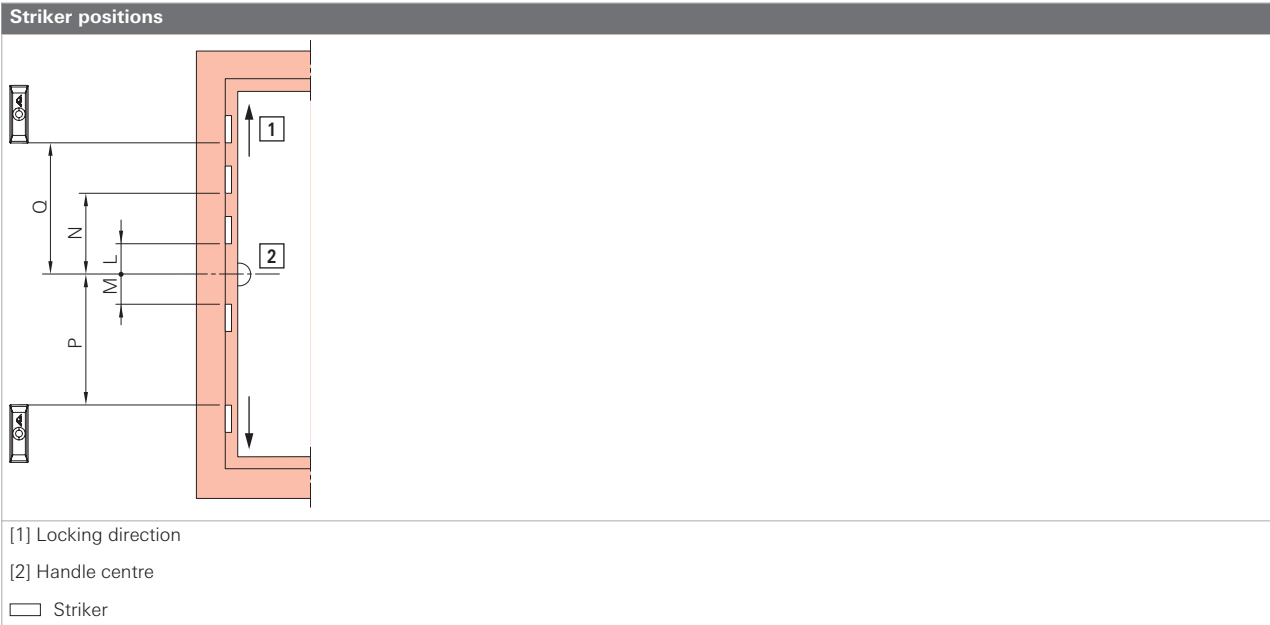


11.5.1.2 Striker positions for single-action espagnolettes



Length of espagnolette	Number of hooks (espagnolette)	Length of extension	Number of hooks (extension)	L	M	N	P	Q
240	1	400	1	120	–	–	–	530
400	2	400	1	132	118	–	–	542
600	2	400	1	213	200	–	–	623
800	2	400	1	291	322	–	–	701
1200	3	400	1	153	500	513	–	923
1800	4	400	1	344	350	800	813	1223

11.5.1.3 Striker positions for reverse-action espagnolettes



Length of espagnolette	Number of hooks (espagnolette)	Length of extension	Number of hooks (extension)	L	M	N	P	Q
600	2	400	1	213	224	–	–	623
800	2	400	1	291	346	–	–	701
1200	3	400	1	153	524	513	–	923
1800	4	400	1	344	374	824	813	1223

11.6 Joining the sash and frame



CAUTION

Heavy loads pose a risk of injury.

Lifting and carrying heavy loads in an uncontrolled manner may lead to physical injury.

- ▶ Transport and installation must be carried out by at least two people.
- ▶ Use transportation means. → 16 "Transport" from page 70
- ▶ Note the applicable accident prevention regulations.



ATTENTION

Heavy loads may cause property damage.

Lifting and carrying heavy loads in an uncontrolled manner may lead to property damage.

- ▶ Transport and installation must be carried out by at least two people.
- ▶ Use transportation means. → 16 "Transport" from page 70
- ▶ Do not rest sashes on the rollers.

11.6.1 Inserting the sash



WARNING

Potential risk of death caused by an unsecured sash!

The sash may fall during installation if it is not securely connected to the frame.

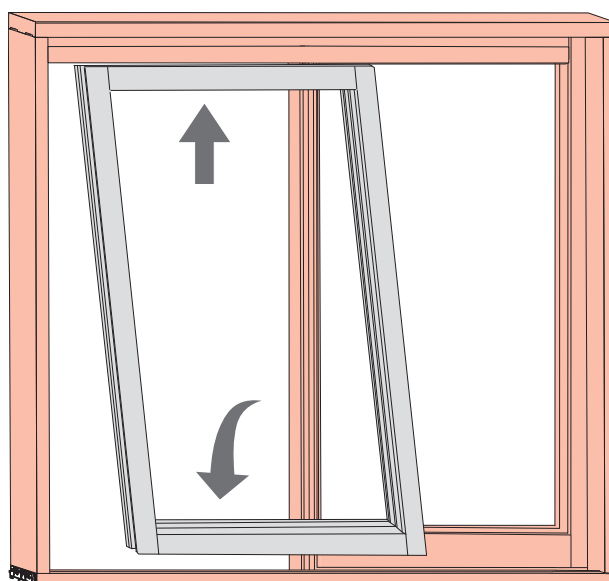
- ▶ Secure the sash to prevent it from falling, e.g. by using two people.



INFO

- Pay attention to the system-specific profile assessment.
- Seal the guide track properly under your own responsibility. Prevent water from entering underneath the guide track.
- Ensure that the guide track is securely attached.

1. Move the handle to the sliding position.
2. In front of the access area, insert the sash at the top of the frame until the sash outline engages in the guide track.
Tilt the sash inwards in a controlled manner at the bottom until the roller units are positioned vertically on the roller track.
Check that the rollers of the roller unit are correctly positioned on the roller track by pushing the sash.



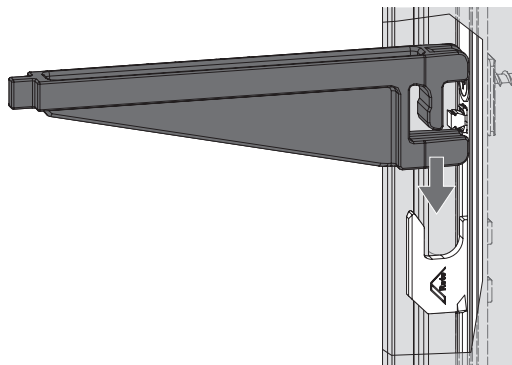
11.6.2 Installing the striker with installation jig

Alternative to direct positioning → from page 54

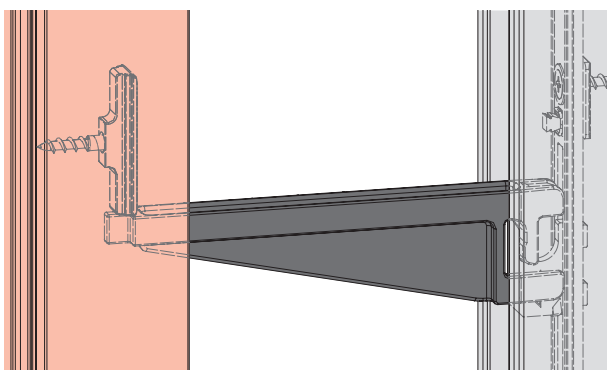
Shown here with the screw-on striker. Also applies to other mounting types.



1. With the sash open, place the installation jig on the hook on the espagnolette side.



2. Close the sash and position the striker in the centre of the frame groove on the installation jig.
Screw down the striker.



11.6.3 Stop part set

Diagram D



CAUTION

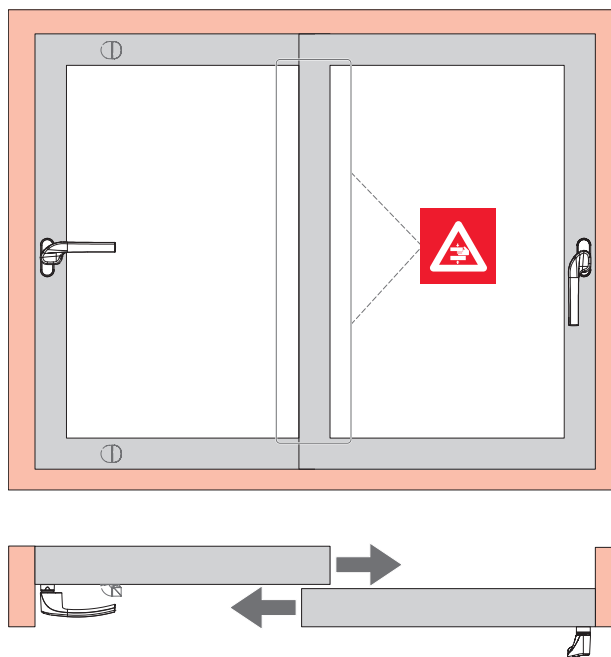
Risk of crushing due to sliding the sash open as far as it will go!

Opening the sash fully without using end stops at the top and bottom may lead to physical injury.

1. The use of end stops is mandatory in conjunction with a sliding handle on the outside for inward running sashes or on the inside for outward running sashes.
2. Ensure that there is enough space between the sliding handle / recessed grip and the faceplate when the sash is open.

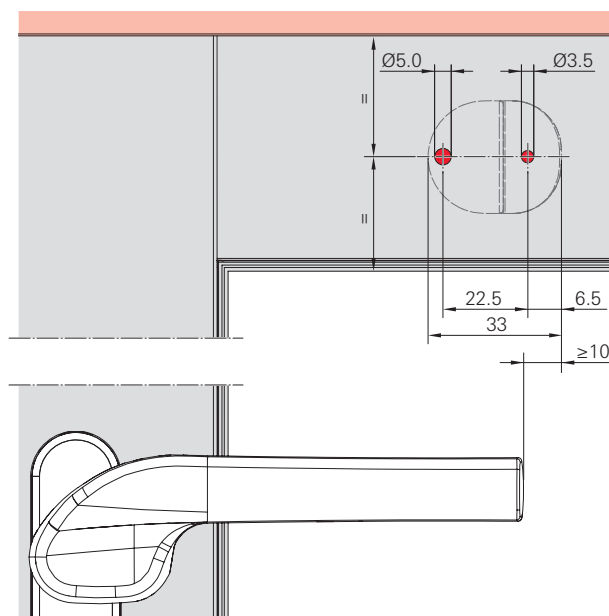
Installation
Joining the sash and frame
Stop part set

1. Define the end stop position.



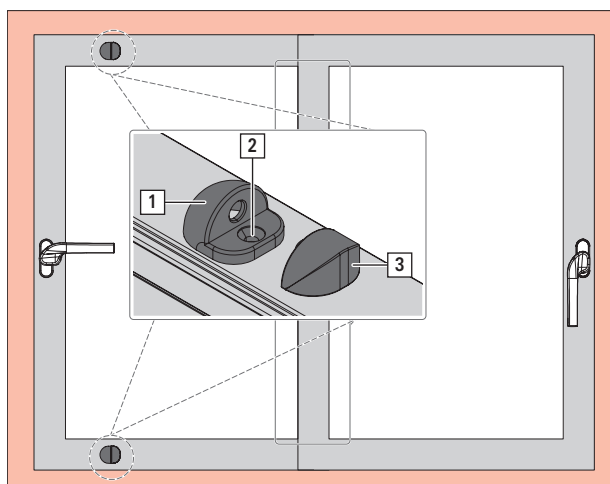
Installing the stop part set

1. Carry out drilling work at the top and bottom of the sash:
For locating aid: 1 x Ø 5.0 mm, at least 9 mm deep.
For screw (X): 1 x Ø 3.5 mm, at least 9 mm deep.





2. Position the stop part [1] in the area of the fixed glazing at the top and bottom.
Fasten with one screw [2] each.
Attach the rubber part [3].



11.6.4 Notes on final assembly



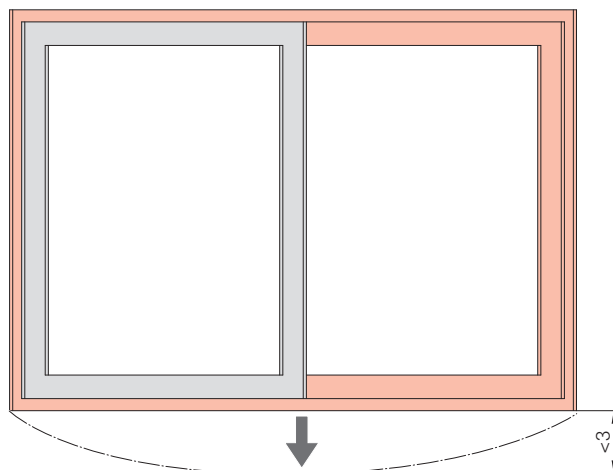
DANGER

Risk of death caused by excessive bending of the running profile.

Incorrect installation of the sash in an element that bends by ≥ 3 mm may cause the sash to fall out.

1. Underlay the element so that it bends by < 3 mm.

In order to ensure the proper functioning and security of the element, check that the frame is not bent by more than 3 mm.



12 Adjustment



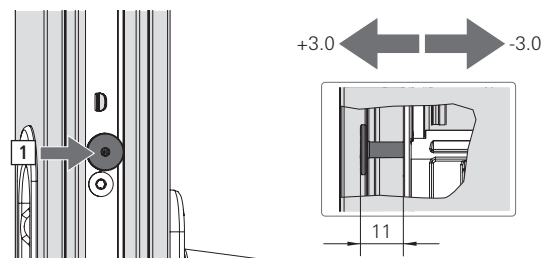
INFO

Roto hardware components may only be adjusted by authorised professionals when the element is installed.

12.1 Lateral adjustment

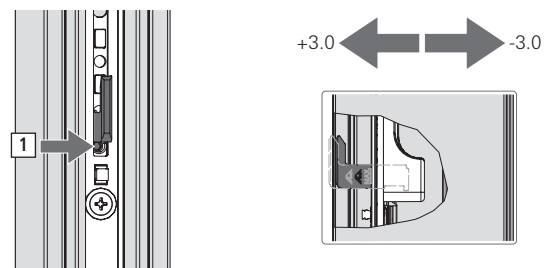
12.1.1 Mishandling device

1. Open the element.
2. Delivery state: 11 mm
Lateral adjustment (position of the sash relative to the frame) on the mishandling device
+3 mm / -3 mm.
Tool: size 2.5 hex key



12.1.2 Hook, adjustable

1. Open the element.
2. Guide the hex key into the recess [1] in front of the adjustable hook up to the screw.
Lateral adjustment (position of the sash relative to the frame) on the hook +3 mm / -3 mm.
Maximum adjustment can be seen from the marking.
Tool: size 2.5 hex key



12.2 Height adjustment

12.2.1 Roller unit

Version 1 is shown here

1. Open the element.



2. Guide the hex key through the bottom hole in the sash up to the screw.

Equal height adjustment on all roller units:

Version 1: +4 mm / -2 mm

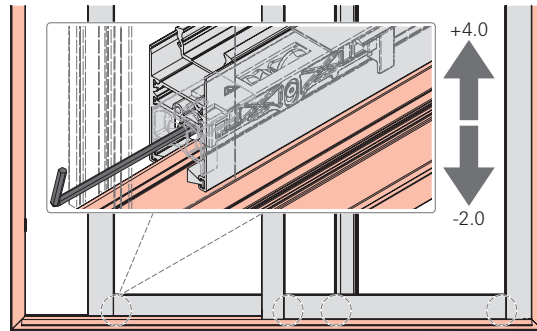
Version 2: +6 mm / -0 mm

Tool: long hex key (length 150 mm) 4 mm



INFO

The screw has a defined final position.
When you start to feel resistance, stop
turning the screw.



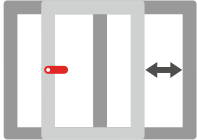
13 Operation

13.1 Operating information

The windows and balcony doors are operated using a handle.

The following symbols illustrate the different handle positions and the resultant sash positions of the windows and balcony doors.

13.1.1 Roto Patio Inline

Handle position	Sash position	Meaning
		Sash in closed position.
		Sash in sliding position.

13.2 Fault assistance

Fault	Cause	Corrective action	To be carried out by
Handle is difficult to turn.	Frame components have not been greased.	Grease the frame components.	☐
	Handle is damaged.	Replace the handle.	■
	Handle screwed into place too tightly.	Undo the screw fixing slightly.	■
	Sash components with slanting screws.	Screw the sash components in straight.	■
	Sash components are damaged.	Replace the sash components.	■
	Incorrect striker positions.	Adapt the striker positions.	■
Roller unit blocked.	Roller track is dirty.	Clean the roller track.	☐
	Roller track not compatible with roller unit version.	Replace the roller unit → <i>from page 53</i> .	■
	Roller assembly on roller unit damaged.		
Hooks scrape against the striker.	Sash components installed incorrectly.	Check the setting in the turn position (potentially modify – start from the espagnolette).	■
	Incorrect striker positions.	Adapt the striker positions.	■

☐ = May be carried out by a specialist company or the end user

■ = **Must** be carried out by a specialist company



14 Maintenance



CAUTION

Performing maintenance work incorrectly can lead to injuries.

Performing maintenance incorrectly can lead to injuries.

- ▶ Ensure that there is sufficient space for installation before starting work.
- ▶ Ensure that the installation site is clean and tidy.
- ▶ Always have hardware adjustment and replacement work performed by a specialist company.
- ▶ Secure the sash against unintentionally opening or closing.
- ▶ Do not unhinge the sash for maintenance.



ATTENTION

Incorrect or improper testing may cause property damage.

Incorrect or improper testing of the hardware may cause the element to malfunction.

- ▶ Have the hardware checked by a specialist company when installed.
- ▶ If defects need to be remedied, have the element unhinged and remounted by a specialist company.



INFO

The manufacturer must draw the attention of builders and end consumers to these maintenance instructions.

Roto Frank Fenster- und Türtechnologie GmbH recommends the manufacturer conclude a maintenance agreement with their end users.

No legal claims can be derived from the following recommendations; their application is to be based on the specific individual case.

	Responsibility	
Maintenance interval	☐	→ from page 63
Cleaning		→ from page 64
Clean hardware	☐	
Care		→ from page 64
Lubricate movable parts	☐	
Lubricate locking points	☐	
Performance test		
Check that hardware components are fitted securely	☐	
Inspect hardware components for wear	☐	
Check that movable parts work properly	☐	
Check that locking points work properly	☐	
Check ease of movement	■	
Repair		→ from page 66
Retighten screws	■	
Replace damaged components	■	

☐ = May be carried out by a specialist company or the end user

■ = **Must** be carried out by a specialist company

14.1 Maintenance intervals



ATTENTION

Failure to adhere to maintenance intervals may cause property damage.

The maintenance interval for all tasks relating to the hardware components is **annually** at the least. In hospitals, schools and hotels, the maintenance interval is **six-monthly**.

Regular maintenance is necessary in order to maintain the proper and smooth-running operation of the hardware and to prevent premature wear or even defects.

- ▶ Determine and adhere to the appropriate maintenance interval in accordance with the ambient conditions.

14.2 Cleaning



ATTENTION

Using incorrect cleaning agents and sealing compounds may cause property damage.

Cleaning agents and sealing compounds may damage the surfaces of components and gaskets.

- ▶ Do not use aggressive or flammable liquids, acidic cleaners or abrasive cleaners.
- ▶ Only use mild, pH-neutral cleaning agents that have been diluted.
- ▶ Apply a thin protective film to the components, for example using a cloth soaked in oil.
- ▶ Avoid aggressive vapours (e.g. produced by formic acid, acetic acid, ammonia, amine compounds, ammonia compounds, aldehyde, carbolic acid, chlorine, tannic acid) around the element.
- ▶ Do not use any acetic acid-crosslinking or acid-crosslinking sealing compounds or those with the aforementioned constituents as both direct contact with the sealing compound and its fumes can corrode the surface of the components.

Cleaning the hardware

- ▶ Clean deposits and contaminants off the hardware using a soft cloth.
- ▶ Lubricate movable parts and locking points after cleaning. → 14.3 "Care" from page 64
- ▶ Apply a thin protective film to the hardware, for example using a cloth soaked in oil.

14.3 Care



ATTENTION

Using incorrect lubricants may cause property damage.

Substandard lubricants can prevent the hardware from working properly.

- ▶ Use high-quality lubricants.
- ▶ Only use resin-free and acid-free lubricants.
- ▶ Use appropriate lubricant in more challenging climatic conditions. Note the manufacturer specifications.



ATTENTION

Cleaning agents and lubricants may pollute the environment.

Leaking or excess cleaning agents and lubricants may pollute the environment.

- ▶ Remove any leaking or excess cleaning agents and lubricants.
- ▶ Dispose of cleaning agents and lubricants separately and properly.
- ▶ Observe the applicable directives and national laws.

Ease of movement can be improved by lubricating or adjusting the hardware. All functional hardware components must be lubricated on a regular basis.

Recommended lubricants

- Roto NX / NT grease
Material number: 782881

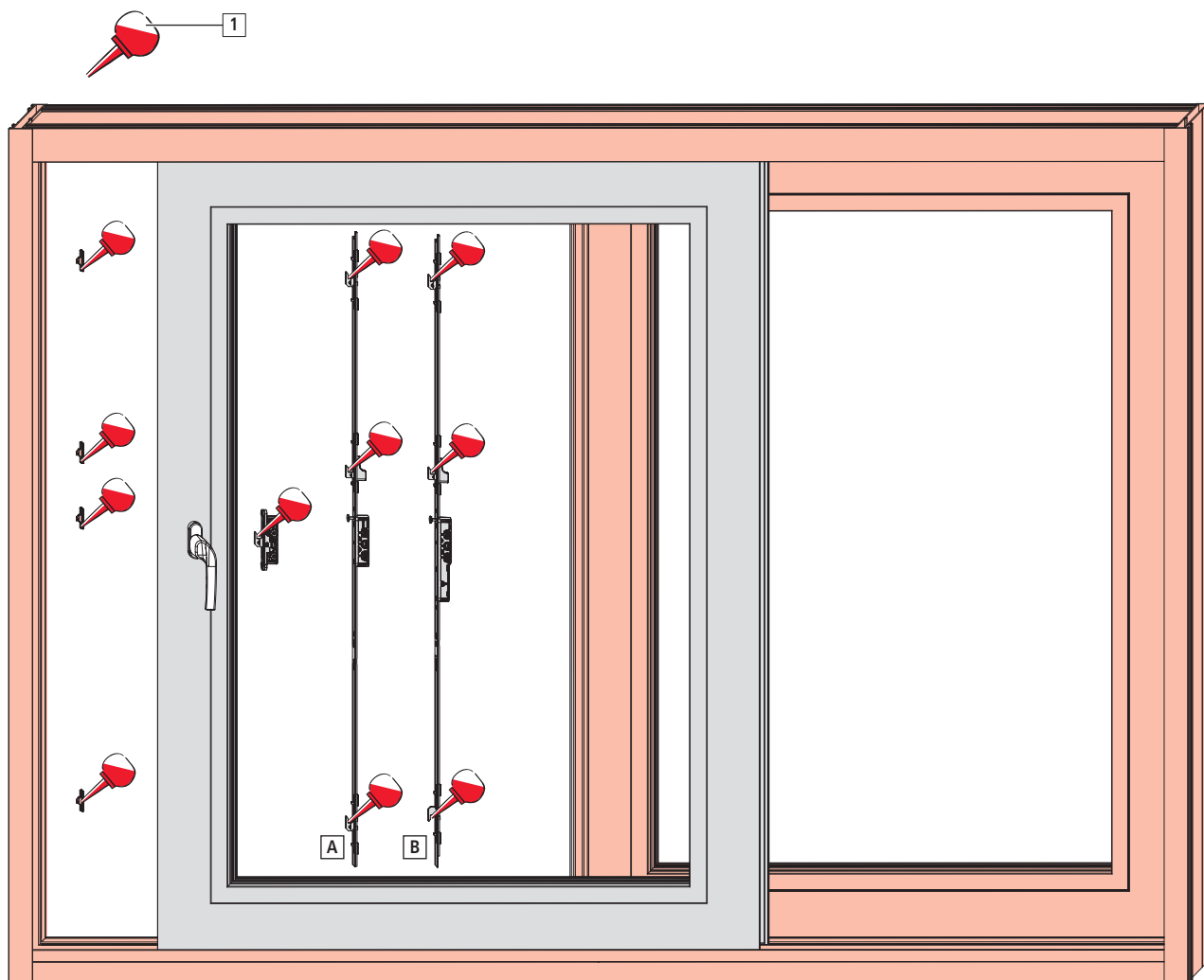


INFO

The figure displays the positioning of potential lubrication points. The figure does not necessarily match the installed hardware. The quantity of lubrication points varies depending on the size and design of the element.



14.3.1 Roto Patio Inline | SR



[1] Lubricant

[A] Single-action espagnolette: lubricate all strikers from below.

[B] Reverse-action espagnolette: lubricate the strikers underneath the espagnolette from above (lubricate all other ones from below).

14.4 Performance test



DANGER

Risk of death caused a defective roller unit / damaged roller track!

A defective roller unit (which can be identified from scraping noises when moving the sash) or a damaged roller track may cause the sash to fall out.

1. If the sash is stiff or does not slide evenly, have it inspected by a specialist company.
2. If the roller track is visibly damaged, have the elements inspected by a specialist company.
3. If necessary, have defective / damaged components replaced.

Check for proper operation:

- ▶ Inspect hardware components for damage, deformation and a secure fit.
- ▶ Check that the elements run smoothly by opening and closing them.
- ▶ Check the element gaskets for elasticity and fit.
- ▶ Check closed elements to ensure that they are leakproof.

- ▶ Locking and unlocking torque max. 10 Nm. The check can be performed using a torque wrench.

Have malfunctions remedied by a specialist company.

14.5 Repair



WARNING

Improper repair work may pose a risk of death!

Improper maintenance may prevent the element from working properly and make it less safe to use.

- ▶ Always have repairs performed by a specialist company.



ATTENTION

Improper screw fixings may cause property damage.

Loose or faulty screws can prevent the hardware from working properly.

- ▶ Check that the individual screws are secure and seated correctly.
- ▶ Tighten or replace loose or faulty screws.
- ▶ Use only the suggested screws.

Repair work includes replacing and repairing components and is only necessary if components have become damaged after wear or as a result of external circumstances. The hardware must be secured reliably in order to ensure that the element works properly and is safe to use.

The following tasks must only be performed by a specialist company:

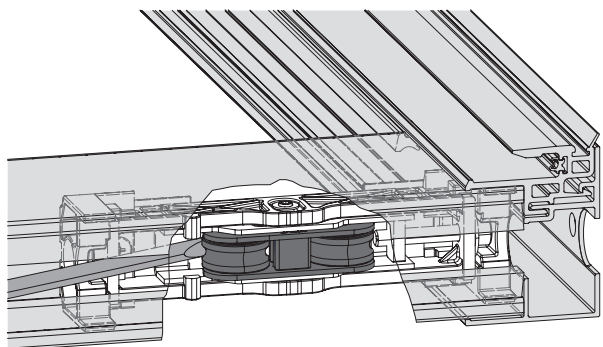
- Adjusting the hardware.
- Replacing the hardware or hardware components.
- Removing and reinstalling the elements.

The specialist company must observe the following:

- Perform the necessary repair work properly, according to generally recognised engineering practice and in accordance with the applicable regulations.
- Do not perform makeshift repairs on worn or damaged components.
- Only use original or approved spare parts for repairs.

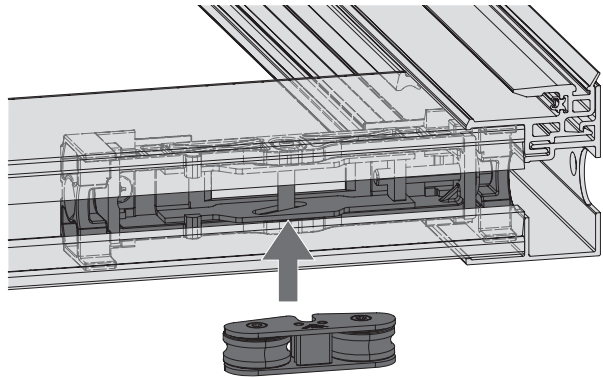
14.5.1 Replacing the roller assembly

1. With the sash unhinged, slide a tool (e.g. screw-driver) under the rollers and jemmy out the roller assembly.





2. Clip a new roller assembly into place.



15 Dismantling



WARNING

Improper dismantling may pose a risk of death!

The sash may fall during dismantling.

- ▶ Secure the sash to prevent it from falling, e.g. by using two people.
- ▶ Always have dismantling work performed by a specialist company.



CAUTION

Physical strain may cause injury and damage to health.

Carrying and lifting heavy loads for extended periods leads to physical injury in the long term.

- ▶ When carrying or lifting loads, maintain an ergonomically correct posture. The maximum permissible load is 25 kg for men and 10 kg for women.



INFO

Unless otherwise stated, dismantling is performed in reverse order to installation.

15.1 Hardware components

Removing hardware components

1. Undo all screw connections.
2. Remove the hardware components.
3. Dispose of the hardware components properly.

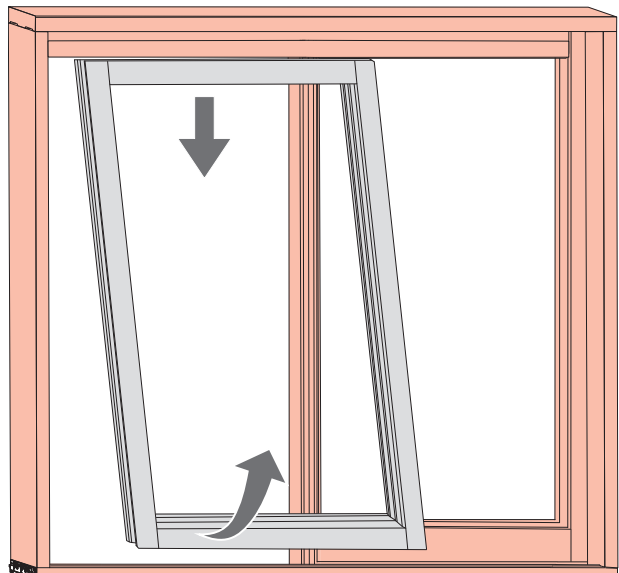
15.2 Unhinging the sash

⇒ Specifications of the profile manufacturer complied with.

1. Move the handle to the sliding position.



2. Lift the sash and tilt it outwards at the bottom.
Lower the sash in a controlled manner until the frame no longer overlaps the sash.





3. Remove the sash parallel to the frame.

16 Transport

16.1 Transporting elements and hardware



DANGER

Improper transport poses a risk of death!

Improper procedures for transporting, loading or unloading elements may cause serious injuries and glass breakage as a result of the elements swinging open, falling or becoming overloaded.

- ▶ Note the applicable accident prevention regulations.
- ▶ Note force application points and reaction forces.
- ▶ Prevent the sash from opening uncontrollably.
- ▶ Avoid jerky movements.
- ▶ Use suitable transportation means and protective devices.
- ▶ Watch out for protruding components.
- ▶ Transport heavy loads with two people and use suitable transportation means (such as an industrial truck).



CAUTION

Trapped limbs may result in injuries.

The transported goods can accidentally skid, open, close or fall during transport. This can result in limbs being trapped and seriously injured.

- ▶ Do not reach near the roller track or guide track.
- ▶ Close the sash after installation and secure it in place for transport.
- ▶ Wear safety gloves and protective footwear.



CAUTION

Physical strain may cause injury and damage to health.

Carrying and lifting heavy loads for extended periods leads to physical injury in the long term.

- ▶ When carrying or lifting loads, maintain an ergonomically correct posture. The maximum permissible load is 25 kg for men and 10 kg for women.

Hardware is supplied to the specialist company as complete sets. The components are packaged accordingly for each scope of delivery. The instructions for safely transporting the hardware are described below.

Observe the following basic instructions when transporting hardware:

- ▶ Transport larger scopes of delivery using appropriate transportation means (such as industrial trucks).
- ▶ Note the transport weight in order to select appropriate transportation means.
- ▶ Ensure that the transport process is careful and appropriate for the material and that components are protected against dirt during transport.
- ▶ Immediately check the delivery for completeness and transport damage on receipt.



INFO

Submit a complaint about any defects as soon as they are identified. Claims for damages may only be made within the reclamation period.

Use the following transportation means for support when transporting, loading and unloading larger scopes of delivery:



- Industrial trucks, e.g. forklifts, telescopic handlers, pallet trucks
- Lifting equipment, e.g. transport nets, carry straps, round slings
- Protective devices, e.g. edge protection, spacer blocks



INFO

Industrial trucks and lifting devices may only be operated by qualified persons.



INFO

Lifting equipment and protective devices may only be used if they are in full working order.

16.2 Storing the hardware

Store all hardware components as follows until they are installed:

- Dry and protected
- On a level surface
- Protected against sunlight

17 Disposal



ATTENTION

Incorrect disposal may pollute the environment.

Pieces of hardware are raw materials.

- ▶ Dispose of hardware for environmentally friendly material re-utilisation as mixed scrap.

17.1 Disposing of packaging

The hardware is supplied as complete sets together with the packaging. Once unpacked, the installation company or builder is responsible for disposing of the packaging properly. The packaging materials are produced in accordance with current environmental protection standards. The materials can be recycled separately.

Follow the basic instructions below for the proper disposal of packaging:

- ▶ Do not dispose of packaging in household waste.
- ▶ Hand over packaging at local waste collection points or recycling centres.
- ▶ Observe the national regulations on the disposal of recyclable materials.
- ▶ Contact the local authorities if necessary.

17.2 Disposing of hardware

Once the hardware is finished with, the end user or builder is responsible for properly disposing of the windows, doors or balcony doors and the hardware, including any accessories. Hardware is produced in accordance with current environmental protection standards. The materials can be recycled separately.

Follow the basic instructions below for the proper disposal of hardware:

- ▶ Observe the information and specifications for disposal contained in the other applicable documents.
- ▶ Separate hardware components from windows, doors or balcony doors.
- ▶ Do not dispose of hardware in household waste.
- ▶ Hand over hardware at local waste collection points or recycling centres.
- ▶ Observe the national regulations on the disposal of recyclable materials.
- ▶ Contact the local authorities if necessary.



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