



Roto Patio Inowa

Intelligent hardware for tightly sealed sliding systems

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1 General information

1.1 Version history

Ver- sion	Date	Changes
v0	08/05/2014	
v1	21/01/2015	
v2	10/06/2015	
v3	03/12/2015	
v4	03/03/2016	
v5	20/09/2016	
v6	06/05/2019	<p>Handles deleted, reference to CTL_1</p> <p>All information on the mishandling device deleted.</p> <p>All information on the stop part deleted.</p> <p>Hardware overviews and parts lists changed.</p> <p>Brief instructions added → <i>from page 69.</i></p> <p>Installation sequence changed. → <i>from page 83</i></p> <p>Installation of roller units, control unit and centre closers; assignment of drilling jig to diagram amended.</p> <p>Installation of mullion striker changed.</p> <p>Installation instructions for inserting sash changed.</p> <p>Installation of flush-encased gearbox fixing added → <i>from page 94.</i></p> <p>Installation of anti-pushback function added.</p> <p>Installation of operating sequence control added.</p> <p>Installation of operator track added.</p> <p>Installation of operator track stopper added.</p> <p>Notes on final assembly added → <i>from page 132.</i></p> <p>Installation drawings changed and added. → <i>133</i></p>
v7	17/01/2020	<p>Hardware overviews and parts lists changed.</p> <p>Drilling and routing dimensions for flush-encased gearbox with profile cylinder length 525 changed → <i>from page 74.</i></p> <p>Operator track stopper position amended → <i>from page 129.</i></p> <p>Position of striker to prevent incorrect operation in hardware overviews and installation drawings amended.</p> <p>Position of anti-pushback function in hardware overviews amended.</p>
v8	15/04/2021	<p>Application range changed → <i>from page 24.</i></p> <p>Component drawings changed → <i>from page 27.</i></p> <p>Centre fixing is undone by being screwed down. Changed for roller units, control unit and centre closers.</p> <p>Roller units, control unit and centre closers changed.</p> <p>Installation drawings changed → <i>from page 133.</i></p> <p>Components with Soft function added → <i>from page 65.</i></p> <p>Mullion locking cam – now also adjustable – added.</p> <p>Adjustment of adjustable components added → <i>from page 145.</i></p> <p>Operation changed → <i>from page 146.</i></p>

Ver- sion	Date	Changes
v9	26/08/2022	<p>Application range 3:1 added → <i>from page 24.</i></p> <p>Tilt protection device added.</p> <p>Roller track dimensions added → <i>from page 27.</i></p> <p>Order quantities added to parts lists.</p> <p>Locking cams and pins for anti-pushback function added.</p> <p>Drilling jig for activator added → <i>from page 63.</i></p> <p>Drilling jig for stopper added → <i>from page 63.</i></p>
v10	04/03/2024	<p>Permissible sash weight changed.</p> <p>Material no. for flush-encased gearbox, lockable in length 475 deleted.</p> <p>Diagram C tilt protection device added → <i>from page 50.</i></p> <p>Application range of control unit with Soft function changed → <i>from page 65.</i></p> <p>Centring unit added → <i>from page 66.</i></p> <p>Installation sequence changed.</p> <p>Preparations for installing the tilt protection device removed.</p> <p>Additional version added to preparations for installing the adapter profile → <i>from page 81.</i></p> <p>Notes on the component test for centre closers added → <i>from page 100.</i></p> <p>Installation of activator with packer amended (new drilling jigs) → <i>from page 118.</i></p>

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:

- Handles catalogue: CTL_1

The following guidelines also apply:

Gütegemeinschaft Schlösser und Beschläge e.V.

- Directive TBDK: 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
	Legend
	Steps

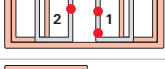
 **INFO**
Any dimensions without a unit in the instructions are given in millimetres (mm). Other units of measurement are clearly indicated by the presence of the differing unit.

 **INFO**
Figures are provided in the left-hand version. 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
	Sash width
	Sash height
	Handle position vertically upwards
	Handle position vertically downwards
	Sash handle height
	Left of sash
	Top of sash
	Top right and bottom right of sash
	Top, bottom, right of sash
	Top left and right and bottom left of sash
	Top left and right and bottom left and right of sash
	Right of sash
	Bottom of sash
	Sash diagram C, position of operating sequence control
	Left of frame
	Top right of frame
	Top and bottom right of frame
	Bottom left of frame

1.5 Product features

Symbol	Meaning
	Width
	Description
	Call-out
	Left / right version
	Colour
	Colour code, Roto
	Sash width
	Sash weight
	Information
	Adjustment
	Length
	Material
	Material number
	Installation type
	Position
	Number of locking cams
	Type of locking cams
	Piece(s)
	Packaging unit



1.6 Abbreviations

Abbreviation	Meaning
approx.	approximately
CTL	Catalogue
BS	Backset
IMO	Installation instructions
SW	Sash width
SH	Sash height
S.kg	Sash weight
HH	Handle height
kg	Kilograms
L	Left
Max.	Maximum
MUL	Mullion
Min.	At least
mm	Millimetres
Not sh.	Not shown
R	Right
RC	Resistance class
T	Connecting rod
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, 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.



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.



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 intended for installation in sliding sashes in windows and balcony doors. The hardware system is only intended for further processing on windows and balcony door sashes for vertical installation made from the materials described in these instructions. The hardware system opens sashes in windows and balcony doors 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 8.*

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 or vertically by operating a handle.

On special structures, various sashes can additionally be brought into a turn position and / or into a tilt position restricted by the scissor stay version.

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 8*.

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.
- ▶ Always have installation performed by a specialist company.

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 overexertion may be harmful 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 leaves improperly poses the risk of injury and property damage.

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

- ▶ When moving the sash, ensure that it will not slam against the frame or other leaves 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 or the opening restrictor.

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 in a saline, aggressive or corrosive environment to the point that they can no longer function.

- ▶ 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.

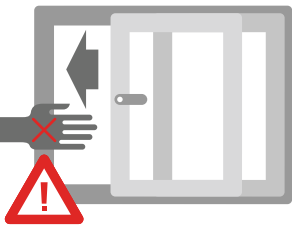
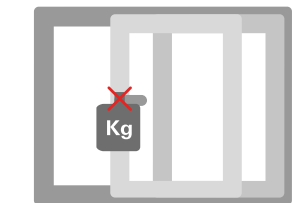
Depending on the outside temperature, relative humidity of the room air and installation situation of the windows and balcony doors, a temporary build-up of condensation may occur. This can lead to corrosion on the hardware and mould growth on the frame or wall. Ambient conditions that are too damp,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

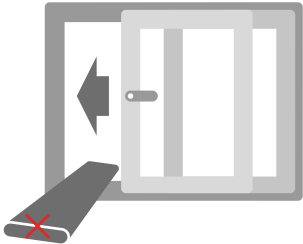
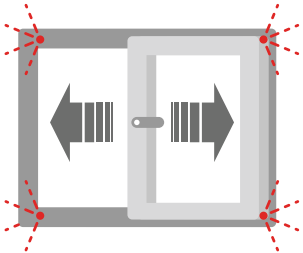
- ▶ Avoid preventing the circulation of air (e.g. due to deep reveals, curtains and unfavourable positioning of heaters or the like).
- ▶ Intensively air out the room several times per day.
Open all windows and balcony doors for approximately 15 minutes so that the air in the room can be completely replaced.
- ▶ 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

- Circumferential gasket
- Concealed hardware
- Intuitive, simple operation
- Even heavy sashes can be opened with less effort because the handle is easy to use.
- Ease of closing thanks to the smooth automatic retraction of the sash into the frame.
- Innovative closing movement perpendicular to the frame profile.
- Active locking points including in the mullion.
- Control unit with Soft function:
 - SoftClose (damped closing)
 - SoftOpen (damped opening)

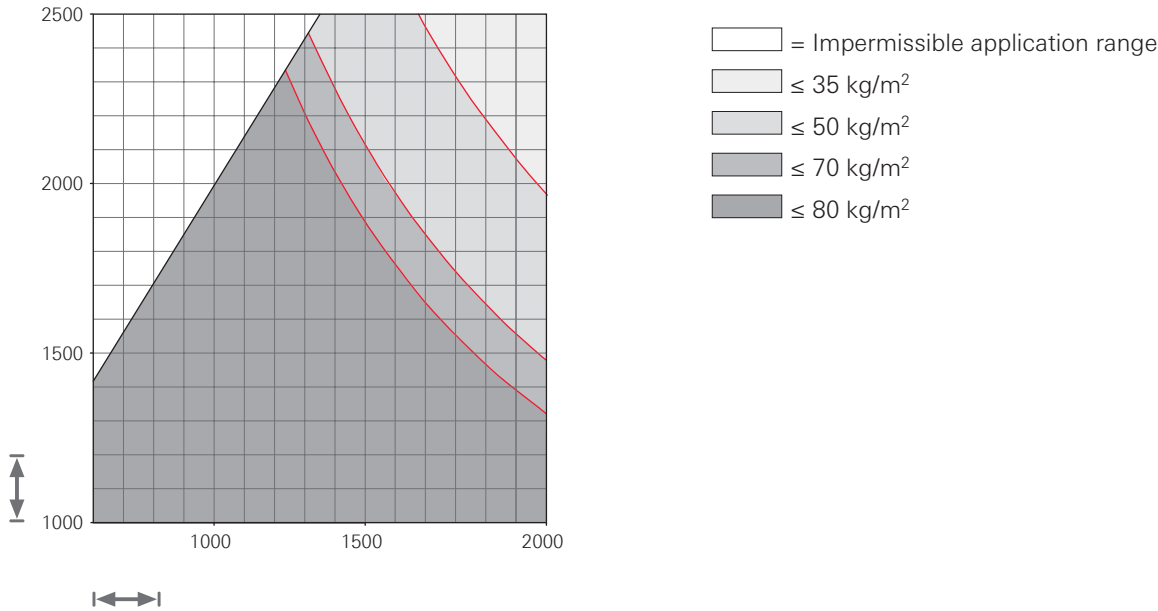
3.2 Application ranges

- The sash runs within the frame profile with a retracting distance of 8 mm.
- Narrow profile views possible
- SW 600 mm – 2000 mm, exceptions:
 - 1 control unit with Soft function SW 620 mm – 2000 mm
 - 2 control units with Soft function SW 880 mm – 2000 mm
- SH 1000 mm – 2500 mm
- S.kg max. 250 kg
- Opening diagrams:
 - A and A' (running inward or outward)
 - K and K' (running inward or outward)
 - C and C' (running inward or outward)
- Basic security and RC 2 / RC 2 N resistance class
- Profile depth ≥ 52 mm
- Operating range -20 °C to +80 °C

3.3 Application diagrams

3.3.1 250 kg

SRH:SRW = max. 2:1



The specifications in the application diagram refer to the glass weight in kg/m^2 .

1 mm/m^2 glass thickness $\approx 2.5 \text{ kg}$

SH:SW = max. 2:1

Application range			
	Sash width (SW)	Control unit without Soft function	600 – 2000 mm
		1 control unit with Soft function	620 – 2000 mm
		2 control units with Soft function	880 – 2000 mm
	Sash height (SH)		1000 – 2500 mm
	Sash weight (S.kg)		Max. 250 kg
–	Glass weight		Max. 80 kg/m^2



INFO

When using control units with soft function:

S.kg > 20 kg



SH:SW = min. 2:1 up to max. 3:1 – with tilt protection device

For PVC profiles, diagrams A, A', K and K'. Diagrams C and C' available upon request.

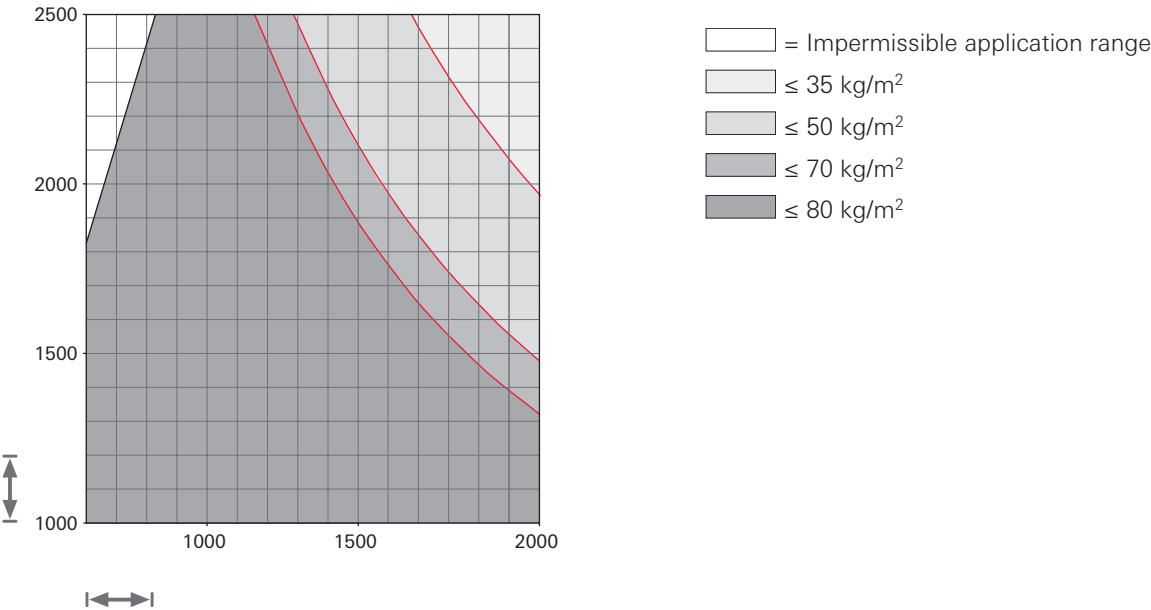


DANGER

The uncontrolled tilting of sashes with aspect ratios > 2:1 poses a risk of death!

Uncontrolled tilting may cause sashes with aspect ratios > 2:1 to jump out of the operator track. This many lead to hazardous situations and cause serious or fatal accidents.

- ▶ The roller track must have two walls → 3.6 “Dimensions of the roller track” from page 27.
- ▶ Install the tilt protection device (only without control unit with Soft function) → 3.7 “Dimensions of the tilt protection device” from page 27.
- ▶ An installation space examination is a mandatory part of a profile assessment.



The specifications in the application diagram refer to the glass weight in kg/m².

1 mm/m² glass thickness ≈ 2.5 kg



INFO

The use of control units with Soft function is not possible with aspect ratios > 2:1.

Application range		
	Sash width (SW)	600 – 2000 mm
	Sash height (SH)	600 – 2500 mm
	Sash weight (S.kg)	Max. 250 kg
–	Glass weight	Max. 80 kg/m ²

3.4 Design variants

3.4.1 Overview

Diagram A

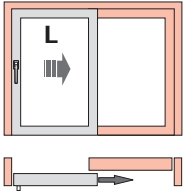
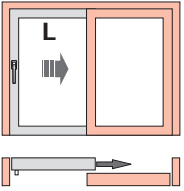
Diagram A (running on the inside)	Diagram A' (running on the outside)
	
1 sliding sash (left or right) 1 fixed glazing element	1 sliding sash (left or right) 1 fixed glazing element

Diagram C

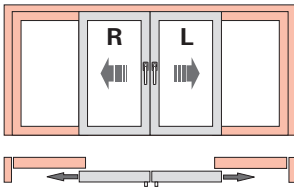
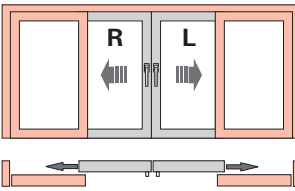
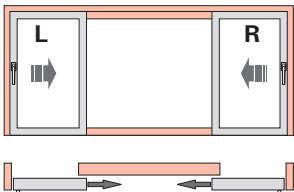
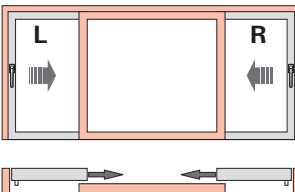
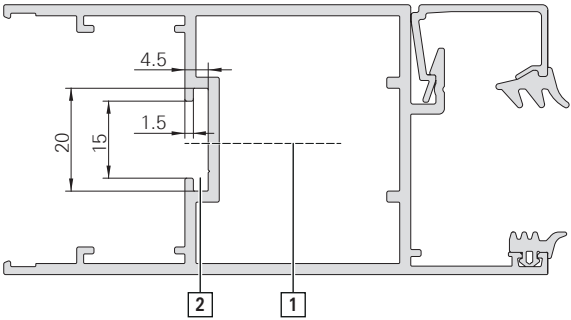
Diagram C (running on the inside)	Diagram C' (running on the outside)
	
2 sliding sashes (left and right) 2 fixed glazing elements	2 sliding sashes (left and right) 2 fixed glazing elements

Diagram K

Diagram K (running on the inside)	Diagram K' (running on the outside)
	
2 sliding sashes (left and right) 1 fixed glazing element	2 sliding sashes (left and right) 1 fixed glazing element

3.5 Hardware groove dimensions



Sash profile cross section

[1] Hardware axis

[2] Hardware groove

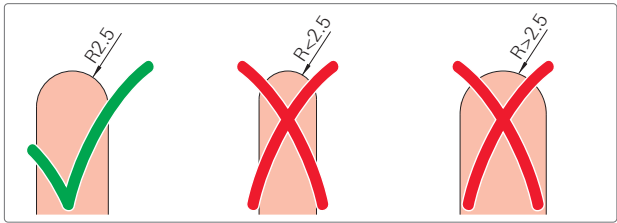


3.6 Dimensions of the roller track



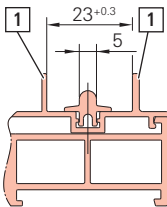
INFO

Roller track only made from stainless steel or anodised aluminium.



Roller track shape

3.7 Dimensions of the tilt protection device

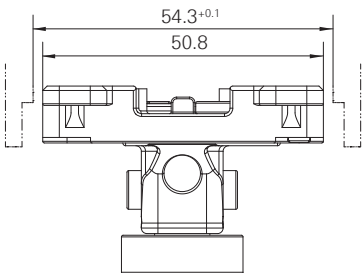
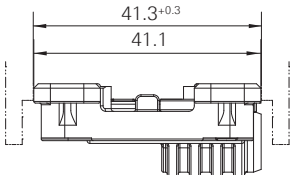
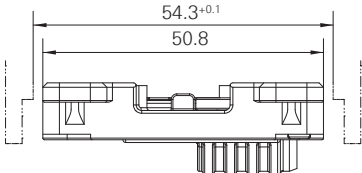
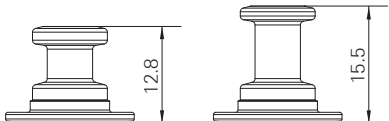
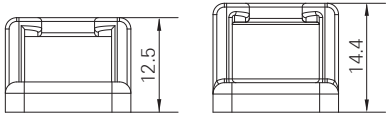


Two walls [1] next to the roller track are required for aspect ratios > 2:1.

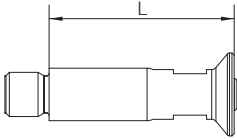
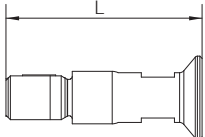
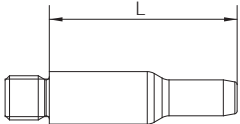
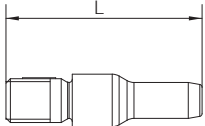
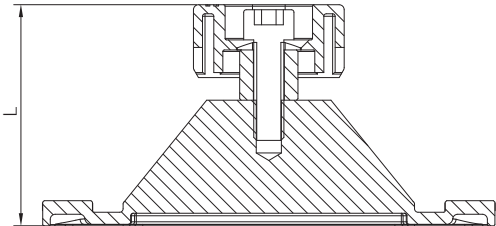
3.8 Component dimensions

Roller unit	Description
	Size 41
	Size 51
Control unit	Description
	Size 41

Information on the product
Component dimensions

Control unit	Description
	Size 51
Centre closer	Description
	Size 41
	Size 51
Rubber buffer	Description
	Size 16.5 Size 17.5
SEC locking cam	Description
	Size 12.8 Size 15.5
SEC striker	Description
	Size 12.5 Size 14.4



Mullion locking cam		Description
		L = 17.4 – 62.4
		Adjustable L = 19.8 – 53.5
Pin for anti-pushback function		Description
		L = 20.0 – 46.5
		Adjustable L = 35.5 – 53.5
Operating sequence control set		Description
		Distance 40.0 – 50.0

4 Hardware overviews

The hardware overviews on the following pages are a recommendation on the part of Roto Frank Fenster- und Türtechnologie 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:



INFO

Resistance classes

- The RC 2 and RC 2 N resistance classes refer to the entire system.
- The hardware complies with the corresponding resistance classes in the required system tests.
- However, the resistance classes are only complied with if all of the other components in the system (e.g. profile system, reinforcement, glass, etc.) are also designed for this.



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 Diagram A, K

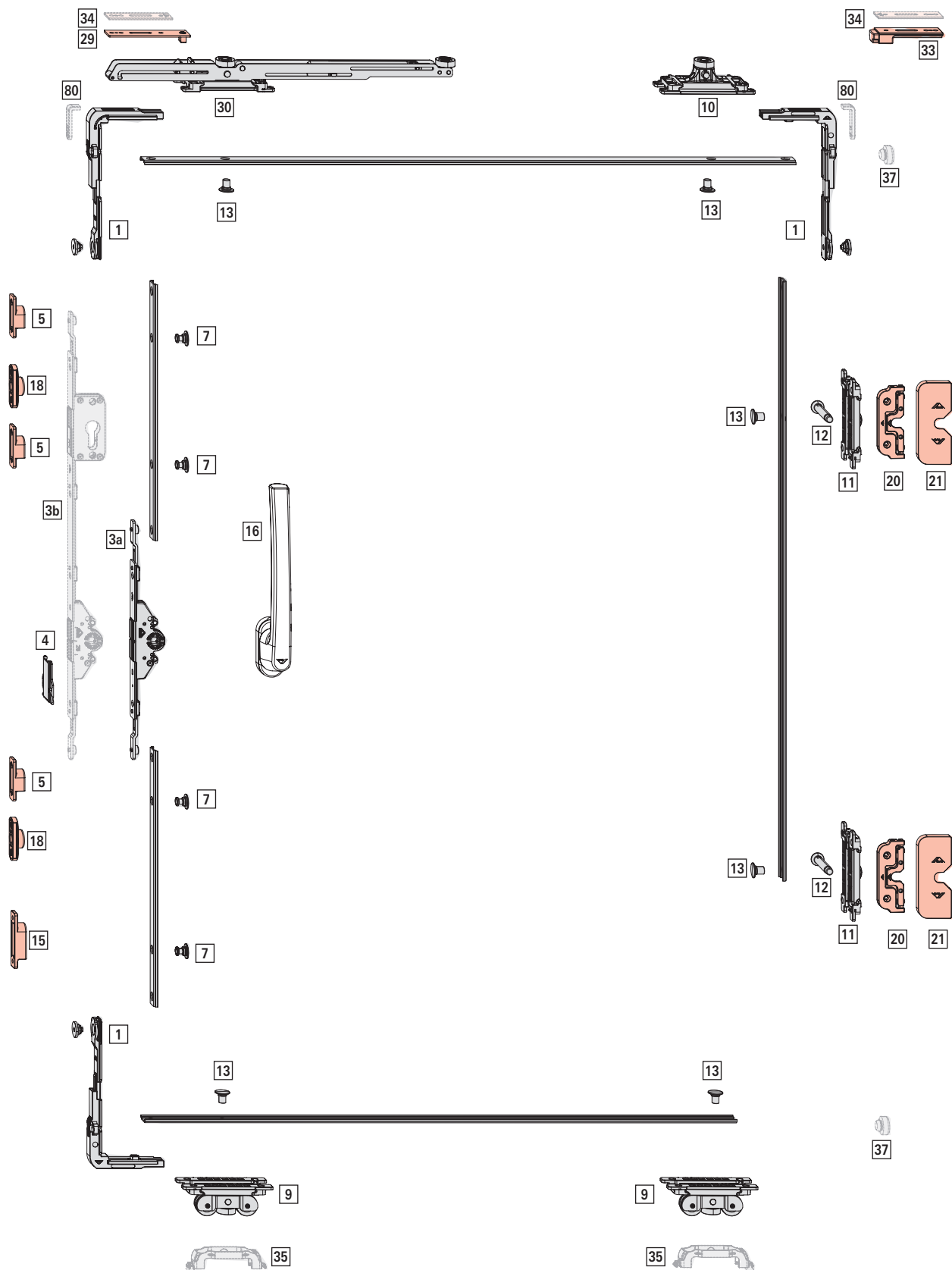


Fig. 4.1: Shown: left version; SW 900 mm; SH 1900 mm; espagnolette BS 25; S.kg 150 kg; control unit with SoftClose



Application range

SW: 600 – 2000 mm

SH: 1000 – 2500 mm

S.kg: max. 250 kg

[1] Corner drive, reinforced 		
		Nº
–	–	781822

[3b] Flush-encased gearbox, lockable (alternative to 3a) 			
			Nº
Flush-encased gearbox	15	280	817163
	25	280	625430
	30	280	625431
	35	280	625432
	40	280	625433

[4] FEG fixing, not compatible with flush-encased gearbox BS 15 	
	Nº
Fixing for flush-encased gearbox	809700

[5] Striker 	
	Nº
12.5	482260
14.4	744684

	
< 1400	1
1400 – 1970	2
> 1970	3

[7] Locking cam 	
	Nº
12.8	639931
15.5	757585

	
< 1400	2
1400 – 1970	3
> 1970	4

[9] Roller unit		
		Nº
41	Left	821686
	Right	823733
51	Left	823734
	Right	823735
		
< 1100		2
≥ 1100		3

[10] Control unit, on the mullion side and in the centre → *from page 65*  1-2
Alternatively (on the mullion side):
Control unit set with Soft function (incl. activator) → *from page 65*  1

		Nº
41	Left	821685
	Right	823730
51	Left	823731
	Right	823732

[*] Control unit set with Soft function, on the locking side → *from page 65*  1
Alternatively:
[10] Control unit

Contents:

[*]		#
[29]	Activator	1
[30]	Control unit with Soft function	1

[11] Centre closer		
		Nº
41	Left	821687
	Right	823736
51	Left	823737
	Right	823738

	
≤ 1400	2
1401 – 2200	3
> 2200	4

[12] MUL locking cam	
	Nº
17.4	809611
19	2006942
20	808632
21.9	809613
23.9	794770
24.6	775929
26.5	839698
28	858555
29	2031030
30	814786
31.5	809772
32.8	809612
33.5	819884
34.4	771375
37.5	836782
38.4	809614
39	2006890
39.5	839428
40.5	896989
41.4	798976
44	2007049
46	817228

	Nº
47.5	806839
53.5	837747
55.5	861579
62.4	809625

	
≤ 1400	2
1401 – 2200	3
> 2200	4

[13] Control cam

	Nº
Control cam D8	835324

		
> 1400	≤ 1100	6
	> 1100	8
1400 – 2200	≤ 1100	7
	> 1100	9
> 2200	≤ 1100	8
	> 1100	10

[15] Striker to prevent incorrect operation

	Nº
Striker to prevent incorrect operation	822788

[16] Handle (200 mm handle length) → CTL_1 Recessed grip (43 mm distance), not sh. → CTL_1

[18] Buffer

	Nº
14	635307
16.5	757701
17.5	757587

[20] MUL striker

	Nº
Screw-on	793493
	
≤ 1400	2
1401 – 2200	3
> 2200	4

[21] Cover cap for MUL striker

		Nº
R01.1	Natural silver	819632
R05.3	Medium bronze	819631
R06.2	Jet black	798979
R07.2	Traffic white	808054

	
≤ 1400	2
1401 – 2200	3
> 2200	4

[33] Stopper, cannot be used in conjunction with a control unit with SoftOpen and Soft-Stop on the mullion side.  1
Alternatively:
[37] Rubber buffer → *from page 66*

	Nº
Stopper	800196

[34] Packer; profile-related quantity ^[1]

	Nº
Packer	800197

Alternatively

[3b] Flush-encased gearbox, lockable (alternative to 3a)

			Nº
Lockable flush-encased gearbox	25	525	811483
	30	525	811484
	35	525	811495
	40	525	811496

[5] Striker

	Nº
12.5	482260
14.4	744684

	
< 1600	1
1600 – 1970	2
> 1970	3

[7] Locking cam

	Nº
12.8	639931
15.5	757585

	
< 1600	2
1600 – 1970	3
> 1970	4

[1] Only use the number of packers that is specified in the profile assessment.



[11] Centre closer, adjustable

		Nº
41	Left	823751
	Right	823752
51	Left	823753
	Right	823754
		
≤ 1400		2
1401 – 2200		3
> 2200		4

[12] MUL locking cam, adjustable

		Nº
Gasket compression adjustable	25	895955
	26	895966
	27	895970
	32	786728
	34.5	2010069
	35.5	858628
	36	895972
	39.5	839047
	42	861550
	44	895973
	45.8	791838
	47.8	788696
	49	895974
	53.5	839045
		
≤ 1400		2
1401 – 2200		3
> 2200		4

Optional

Connecting rod for ECC-groove

			Nº
3 m connecting rod	ECC-groove	1 Piece(s)	735102
6 m connecting rod	ECC-groove	1 Piece(s)	334665

[35] Brush holder

	Nº	
Brush holder	809520	
		
< 1100		2
≥ 1100		3

[80] Tilt protection device; for application ranges SH:SW ≥ 2:1 up to max. 3:1; can only be used without control unit with Soft function.		 2
--	--	---

	Nº
Tilt protection device	897049

4.2 Diagram A, K – RC 2 / RC 2 N

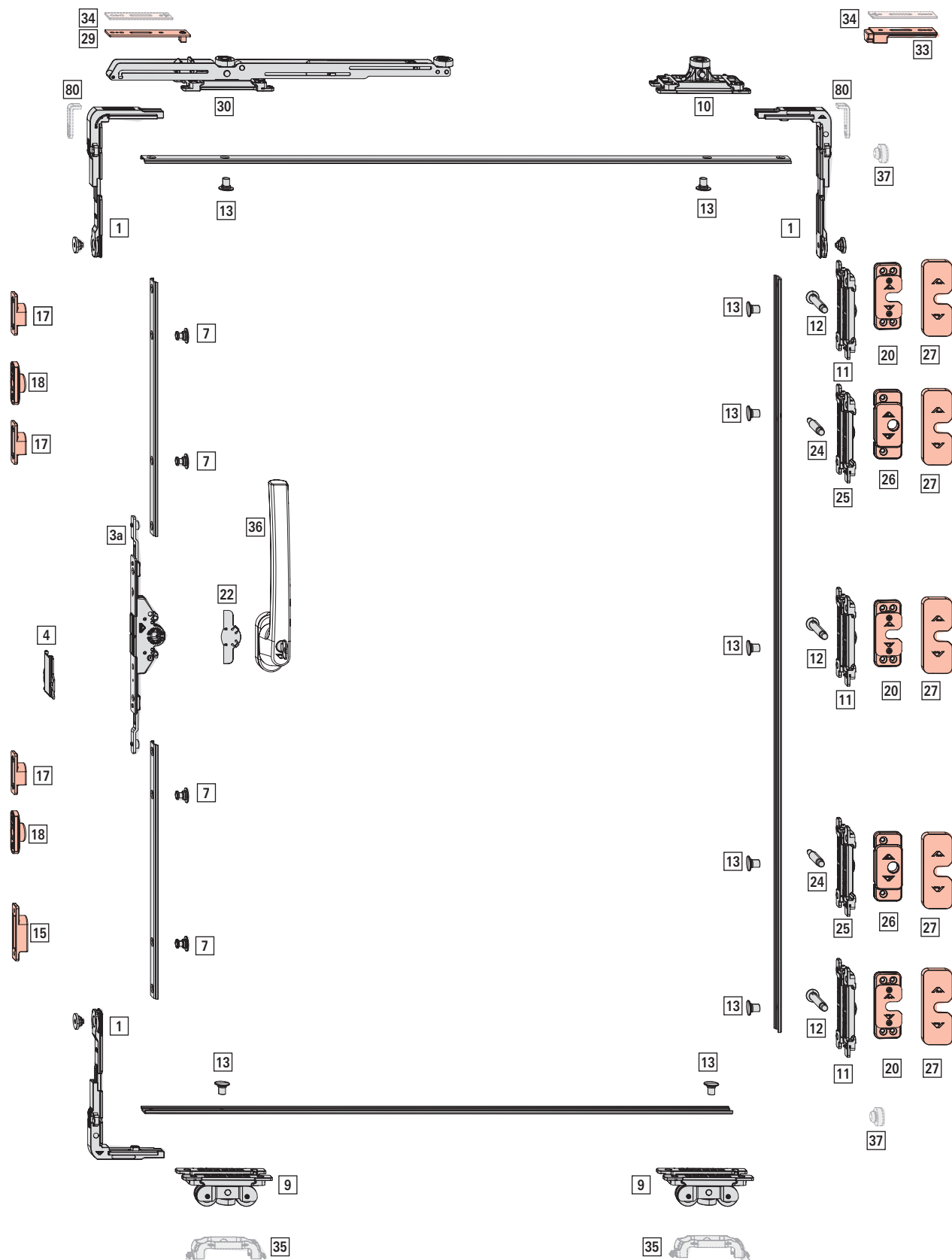


Fig. 4.2: Shown: left version; SW 900 mm; SH 1900 mm; espagnolette BS 25; RC 2



Application range

SW: 600 – 2000 mm

SH: 1000 – 2500 mm

S.kg: max. 250 kg

[1] Corner drive, reinforced 		
		Nº
–	–	781822

[3a] Flush-encased gearbox 			
			Nº
Flush-encased gearbox	15	280	817163
	25	280	625430
	30	280	625431
	35	280	625432
	40	280	625433

[4] FEG fixing, not compatible with flush-encased gearbox BS 15 	
	Nº
Fixing for flush-encased gearbox	809700

[7] Locking cam	
	Nº
12.8	639931
15.5	757585
	
< 1400	2
1400 – 1970	3
> 1970	4

[9] Roller unit		
		Nº
41	Left	821686
	Right	823733
51	Left	823734
	Right	823735
		
< 1100		2
≥ 1100		3

[10] Control unit, on the mullion side and in the centre → from page 65 		
Alternatively (on the mullion side):		
Control unit set with Soft function (incl. activator) → from page 65 		
		Nº
41	Left	821685
	Right	823730
51	Left	823731
	Right	823732

[*] Control unit set with Soft function, on the locking side → from page 65 	
Alternatively:	
[10]	Control unit

Contents:

[*]		#
[29]	Activator	1
[30]	Control unit with Soft function	1

[11] Centre closer		
		Nº
41	Left	821687
	Right	823736
51	Left	823737
	Right	823738

	
≤ 1400	2
1401 – 2200	3
> 2200	4

[12] MUL locking cam	
	Nº
17.4	809611
19	2006942
20	808632
21.9	809613
23.9	794770
24.6	775929
26.5	839698
28	858555
29	2031030
30	814786
31.5	809772
32.8	809612
33.5	819884
34.4	771375
37.5	836782
38.4	809614
39	2006890
39.5	839428
40.5	896989
41.4	798976
44	2007049
46	817228
47.5	806839
53.5	837747
55.5	861579
62.4	809625

	
≤ 1400	2
1401 – 2200	3
> 2200	4

[13] Control cam

		Nº
Control cam D8		835324
		
> 1400	≤ 1100	8
	> 1100	10
1400 – 2200	≤ 1100	9
	> 1100	11
> 2200	≤ 1100	10
	> 1100	12

[15] SEC striker to prevent incorrect operation

	Nº
Striker to prevent incorrect operation	822795

[16] Handle, lockable (200 mm handle length) → CTL_1 1
Recessed grip (43 mm distance), not sh. → CTL_1 1
[17] SEC striker

	Nº
	
12.5	757695
14.4	793242

		
< 1400		2
1400 – 1970		3
> 1970		4

[18] Buffer

	Nº
	
14	635307
16.5	757701
17.5	757587

[20] SEC MUL striker

	Nº
SEC MUL striker	833688
	
≤ 1400	2
1401 – 2200	3
> 2200	4

[22] Drilling protection

	Nº
Drilling protection	770965

[24] Pin for anti-pushback function

	Nº
	
18	839869
19	2006943
20	816147
28	858556
33	835327
34	822393
37.5	837714
38	820048
39	2006891
40.5	897022
46.5	833594
53.5	838965
55.5	861940

[25] Centre closer for anti-pushback function

		Nº
		
41	Left	821687
	Right	823736
51	Left	823737
	Right	823738

INFO
 L version: order right components.
 R version: order left components.

[26] Striker for anti-pushback function

	Nº
Striker for anti-pushback function	810279

[27] Cover cap for SEC MUL striker / striker for anti-pushback function

		Nº
		
R01.1	Natural silver	828482
R05.3	Medium bronze	828483
R06.2	Jet black	809717
R07.2	Traffic white	819351

		
≤ 1400		4
1401 – 2200		5
> 2200		6

[33] Stopper, cannot be used in conjunction with a control unit with SoftOpen and Soft-Stop on the mullion side.  1
 Alternatively:

	Nº
[37] Rubber buffer → <i>from page 66</i>	
Stopper	800196



[34] Packer; profile-related quantity ^[2]		
		Nº
		
Packer		800197

Alternatively

[11] Centre closer, adjustable		
		Nº
41	Left	823751
	Right	823752
51	Left	823753
	Right	823754
		
≤ 1400		2
1401 – 2200		3
> 2200		4

[12] MUL locking cam, adjustable		
		Nº
Gasket compression adjustable		
	25	895955
	26	895966
	27	895970
	32	786728
	34.5	2010069
	35.5	858628
	36	895972
	39.5	839047
	42	861550
	44	895973
	45.8	791838
	47.8	788696
	49	895974
	53.5	839045
		
≤ 1400		2
1401 – 2200		3
> 2200		4

[25] Centre closer, adjustable, for anti-push-back function 		
		Nº
41	Left	823751
	Right	823752
51	Left	823753
	Right	823754



INFO

L version: order right components.
R version: order left components.

[24] Pin, adjustable, for anti-pushback function 		
		Nº
Gasket compression adjustable		
	25	895977
	26	895984
	27	895989
	32	895994
	35.5	858629
	36	895999
	39.5	839049
	42	861551
	44	896002
	49	896005
	53.5	839048

Optional

Connecting rod for ECC-groove			
			Nº
3 m connecting rod	ECC-groove	1 Piece(s)	735102
6 m connecting rod	ECC-groove	1 Piece(s)	334665

[35] Brush holder		
		Nº
Brush holder		809520
		
< 1100		2
≥ 1100		3

[80] Tilt protection device; for application ranges SH:SW ≥ 2:1 up to max. 3:1; can only be used without control unit with Soft function. 	
	Nº
Tilt protection device	897049

[2] Only use the number of packers that is specified in the profile assessment.

4.3 Diagram A', K'

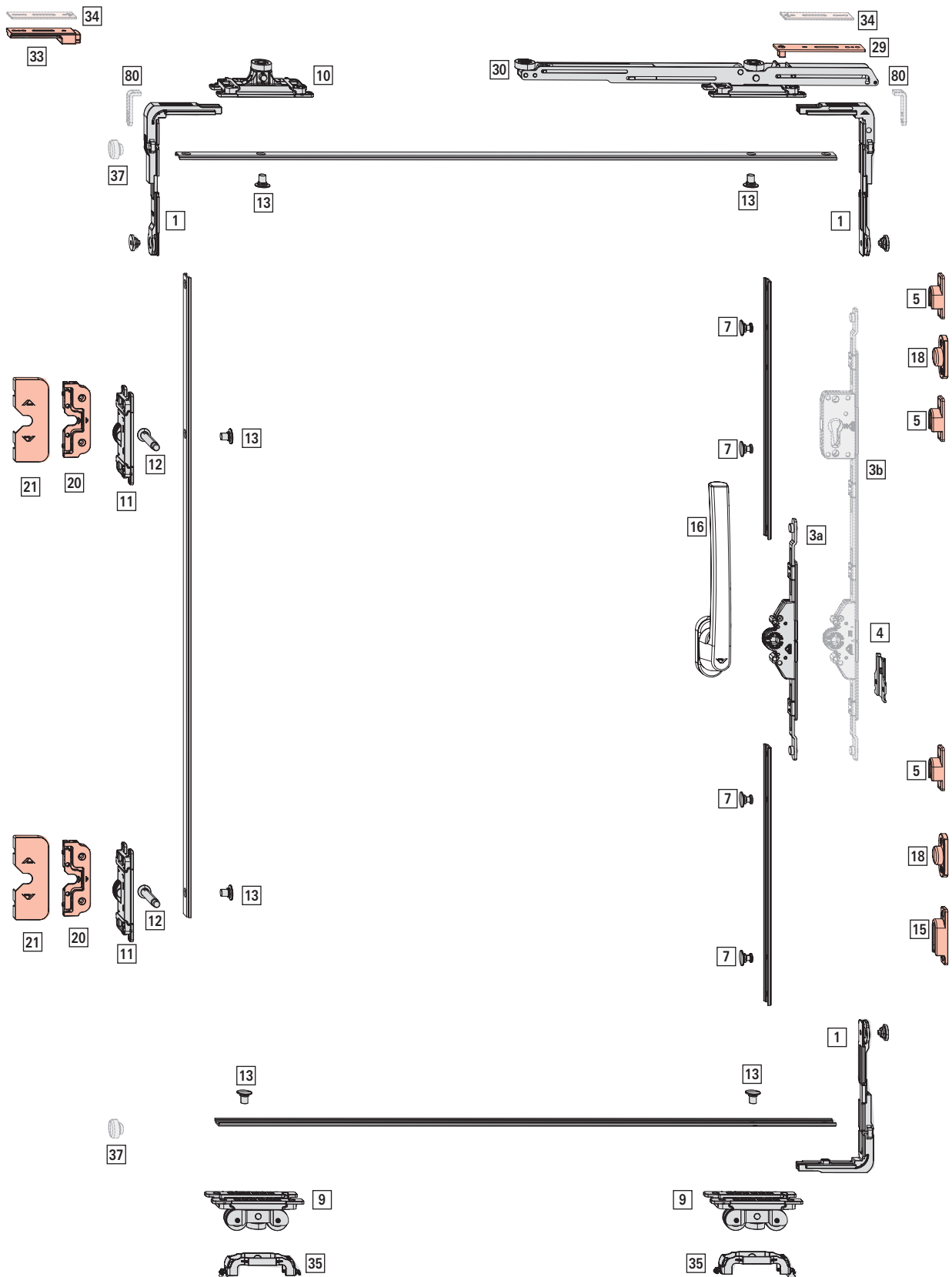


Fig. 4.3: Shown: right version; SW 900 mm; SH 1900 mm; espagnolette BS 25



Application range

SW: 600 – 2000 mm

SH: 1000 – 2500 mm

S.kg: max. 250 kg

[1] Corner drive, reinforced 		
		Nº
–	–	781822

[3b] Flush-encased gearbox, lockable (alternative to 3a) 			
			Nº
Flush-encased gearbox	15	280	817163
	25	280	625430
	30	280	625431
	35	280	625432
	40	280	625433

[4] FEG fixing, not compatible with flush-encased gearbox BS 15 	
	Nº
Fixing for flush-encased gearbox	809700

[5] Striker 	
	Nº
12.5	482260
14.4	744684
	
< 1400	1
1400 – 1970	2
> 1970	3

[7] Locking cam 	
	Nº
12.8	639931
15.5	757585
	
< 1400	2
1400 – 1970	3
> 1970	4

[9] Roller unit 		
		Nº
41	Left	821686
	Right	823733
51	Left	823734
	Right	823735
		
< 1100		2
≥ 1100		3



INFO

L version: order right components.

R version: order left components.



[10] Control unit, on the mullion side and in the centre → *from page 65*
Alternatively (on the mullion side):
Control unit set with Soft function (incl. activator) → *from page 65* 



		Nº
41	Left	821685
	Right	823730
51	Left	823731
	Right	823732



INFO

L version: order right components.

R version: order left components.



[*] Control unit set with Soft function, on the locking side → *from page 65*
Alternatively:
[10] Control unit

Contents:

[*]		#
[29]	Activator	1
[30]	Control unit with Soft function	1



INFO

L version: order right components.

R version: order left components.



[11] Centre closer 		
		Nº
41	Left	821687
	Right	823736
51	Left	823737
	Right	823738



	
≤ 1400	2
1401 – 2200	3
> 2200	4



INFO

L version: order right components.

R version: order left components.

[12] MUL locking cam		
		Nº
		
17.4		809611
19		2006942
20		808632
21.9		809613
23.9		794770
24.6		775929
26.5		839698
28		858555
29		2031030
30		814786
31.5		809772
32.8		809612
33.5		819884
34.4		771375
37.5		836782
38.4		809614
39		2006890
39.5		839428
40.5		896989
41.4		798976
44		2007049
46		817228
47.5		806839
53.5		837747
55.5		861579
62.4		809625
		
≤ 1400		2
1401 – 2200		3
> 2200		4

[13] Control cam		
		Nº
		
Control cam D8		835324
		
> 1400	≤ 1100	6
	> 1100	8
1400 – 2200	≤ 1100	7
	> 1100	9
> 2200	≤ 1100	8
	> 1100	10

[15] Striker to prevent incorrect operation 		
		Nº
		
Striker to prevent incorrect operation		822788

[16] Handle (200 mm handle length) → CTL_1 		
--	--	--

Recessed grip (43 mm distance), not sh. → CTL_1 		
---	--	--

[18] Buffer 		
		Nº
		
14		635307
16.5		757701
17.5		757587

[20] MUL striker		
		Nº
		
Screw-on		793493
		
≤ 1400		2
1401 – 2200		3
> 2200		4

[21] Cover cap for MUL striker		
		Nº
		
R01.1	Natural silver	819632
R05.3	Medium bronze	819631
R06.2	Jet black	798979
R07.2	Traffic white	808054
		
≤ 1400		2
1401 – 2200		3
> 2200		4

[33] Stopper, cannot be used in conjunction with a control unit with SoftOpen and Soft-Stop on the mullion side. 		
Alternatively: [37] Rubber buffer → <i>from page 66</i>		

	Nº
	
Stopper	800196

[34] Packer; profile-related quantity ^[3]		
		Nº
		
Packer		800197

Alternatively

[3b] Flush-encased gearbox, lockable (alternative to 3a) 			
			Nº
			
Lockable flush-encased gearbox	25	525	811483
	30	525	811484
	35	525	811495
	40	525	811496

[3] Only use the number of packers that is specified in the profile assessment.



[5] Striker

	Nº
12.5	482260
14.4	744684
	
< 1600	1
1600 – 1970	2
> 1970	3

[7] Locking cam

	Nº
12.8	639931
15.5	757585
	
< 1600	2
1600 – 1970	3
> 1970	4

[11] Centre closer, adjustable

		Nº
41	Left	823751
	Right	823752
51	Left	823753
	Right	823754
		
≤ 1400		2
1401 – 2200		3
> 2200		4



INFO

L version: order right components.

R version: order left components.

[12] MUL locking cam, adjustable

		Nº
Gasket compression adjustable	25	895955
	26	895966
	27	895970
	32	786728
	34.5	2010069
	35.5	858628
	36	895972
	39.5	839047
	42	861550
	44	895973
	45.8	791838
	47.8	788696
	49	895974
	53.5	839045
		
≤ 1400		2
1401 – 2200		3
> 2200		4

Optional

Connecting rod for ECC-groove

			Nº
3 m connecting rod	ECC-groove	1 Piece(s)	735102
6 m connecting rod	ECC-groove	1 Piece(s)	334665

[35] Brush holder

	Nº
Brush holder	809520
<hr/>	
	
< 1100	2
≥ 1100	3

[80] Tilt protection device; for application ranges SH:SW ≥ 2:1 up to max. 3:1; can only be used without control unit with Soft function.

	Nº
Tilt protection device	897049

4.4 Diagram A', K' – RC 2 / RC 2 N

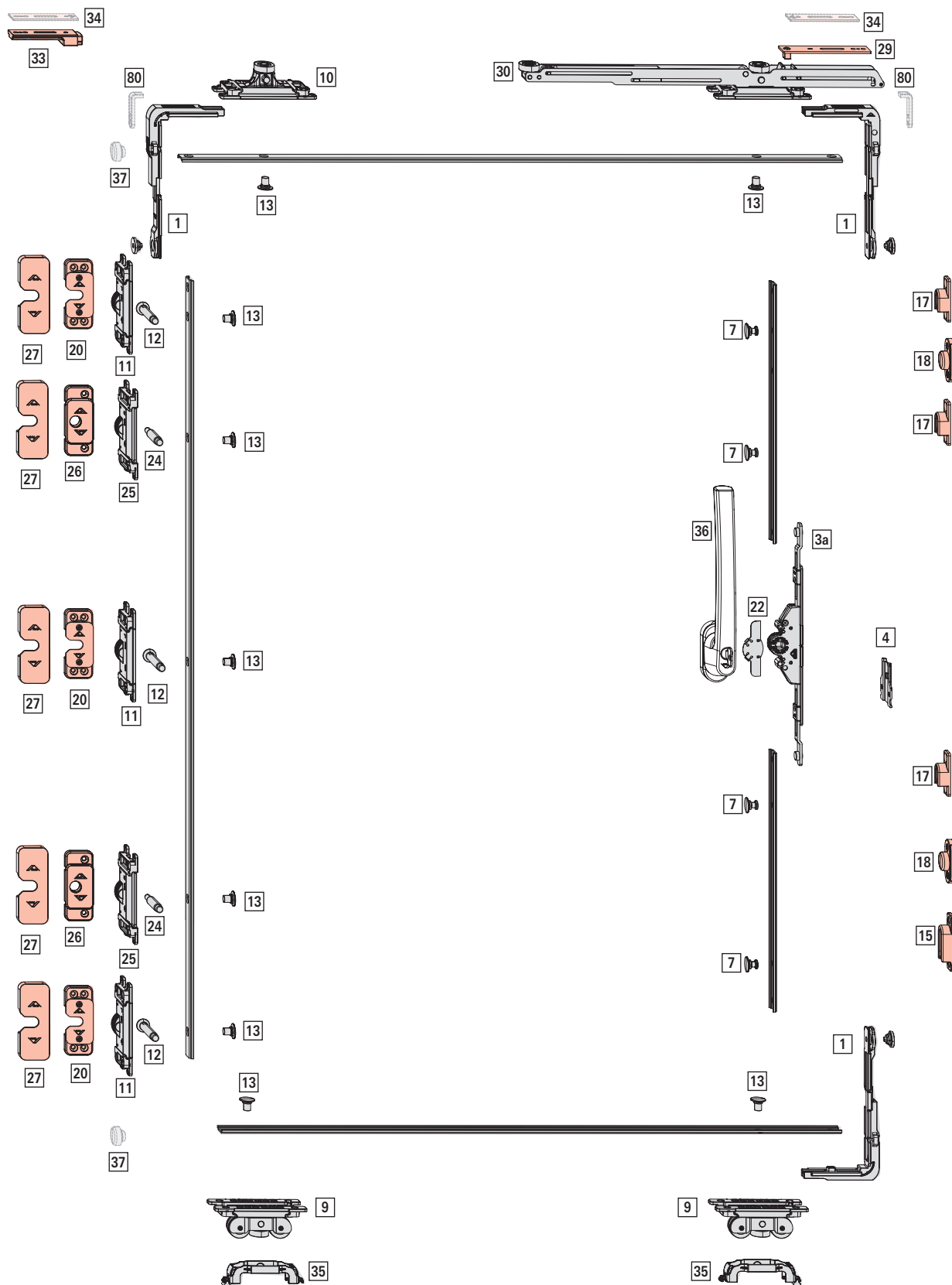


Fig. 4.4: Shown: right version; SW 900 mm; SH 1900 mm; espagnolette BS 25; RC 2



Application range

SW: 600 – 2000 mm

SH: 1000 – 2500 mm

S.kg: max. 250 kg

[1] Corner drive, reinforced 		
		Nº
–	–	781822

[3a] Flush-encased gearbox 			
			Nº
Flush-encased gearbox	15	280	817163
	25	280	625430
	30	280	625431
	35	280	625432
	40	280	625433

[4] FEG fixing, not compatible with flush-encased gearbox BS 15 	
	Nº
Fixing for flush-encased gearbox	809700

[7] Locking cam	
	Nº
12.8	639931
15.5	757585
	
< 1400	2
1400 – 1970	3
> 1970	4

[9] Roller unit		
		Nº
41	Left	821686
	Right	823733
51	Left	823734
	Right	823735
		
< 1100	2	
≥ 1100	3	



INFO

L version: order right components.

R version: order left components.

[10] Control unit, on the mullion side and in the centre → from page 65 	
Alternatively (on the mullion side):	

Control unit set with Soft function (incl. activator) → from page 65 



Nº

41	Left	821685
	Right	823730
51	Left	823731
	Right	823732



INFO

L version: order right components.

R version: order left components.

[*] Control unit set with Soft function, on the locking side → from page 65 	
Alternatively:	
[10] Control unit	

Contents:

[*]



#

[29]	Activator	1
[30]	Control unit with Soft function	1



INFO

L version: order right components.

R version: order left components.

[11] Centre closer		
		Nº
41	Left	821687
	Right	823736
51	Left	823737
	Right	823738



≤ 1400	2
1401 – 2200	3
> 2200	4



INFO

L version: order right components.

R version: order left components.

[12] MUL locking cam	
	Nº
17.4	809611
19	2006942
20	808632
21.9	809613
23.9	794770
24.6	775929
26.5	839698
28	858555
29	2031030
30	814786

	Nº
31.5	809772
32.8	809612
33.5	819884
34.4	771375
37.5	836782
38.4	809614
39	2006890
39.5	839428
40.5	896989
41.4	798976
44	2007049
46	817228
47.5	806839
53.5	837747
55.5	861579
62.4	809625

	
≤ 1400	2
1401 – 2200	3
> 2200	4

[13] Control cam

	Nº
Control cam D8	835324

		
> 1400	≤ 1100	8
	> 1100	10
1400 – 2200	≤ 1100	9
	> 1100	11
> 2200	≤ 1100	10
	> 1100	12

[15] SEC striker to prevent incorrect operation

	Nº
Striker to prevent incorrect operation	822795

[16] Handle, lockable (200 mm handle length)

→ CTL_1
 Recessed grip (43 mm distance), not sh.

→ CTL_1
[17] SEC striker

	Nº
12.5	757695
14.4	793242

	
< 1400	2
1400 – 1970	3
> 1970	4

[18] Buffer

	Nº
14	635307
16.5	757701
17.5	757587

[20] SEC MUL striker

	Nº
SEC MUL striker	833688

	
≤ 1400	2
1401 – 2200	3
> 2200	4

[22] Drilling protection

	Nº
Drilling protection	770965

[24] Pin for anti-pushback function

	Nº
18	839869
19	2006943
20	816147
28	858556
33	835327
34	822393
37.5	837714
38	820048
39	2006891
40.5	897022
46.5	833594
53.5	838965
55.5	861940

[25] Centre closer for anti-pushback function

		Nº
41	Left	821687
	Right	823736
51	Left	823737
	Right	823738

**INFO**

L version: order right components.

R version: order left components.

[26] Striker for anti-pushback function

	Nº
Striker for anti-pushback function	810279



[27] Cover cap for SEC MUL striker / striker for anti-pushback function

		Nº
R01.1	Natural silver	828482
R05.3	Medium bronze	828483
R06.2	Jet black	809717
R07.2	Traffic white	819351
<hr/>		
		
≤ 1400		4
1401 – 2200		5
> 2200		6

[33] Stopper, cannot be used in conjunction with a control unit with SoftOpen and Soft-Stop on the mullion side. 

Alternatively:

[37] Rubber buffer → *from page 66*

	Nº
Stopper	800196

[34] Packer; profile-related quantity ^[4]

	Nº
Packer	800197

Alternatively

[11] Centre closer, adjustable

		Nº
41	Left	823751
	Right	823752
51	Left	823753
	Right	823754
<hr/>		
		
≤ 1400		2
1401 – 2200		3
> 2200		4

 **INFO**
L version: order right components.
R version: order left components.

[12] MUL locking cam, adjustable

		Nº
Gasket compression adjustable	25	895955
	26	895966
	27	895970
	32	786728
	34.5	2010069
	35.5	858628
	36	895972
	39.5	839047
	42	861550
	44	895973
	45.8	791838
	47.8	788696
	49	895974
	53.5	839045

	
≤ 1400	2
1401 – 2200	3
> 2200	4

[25] Centre closer, adjustable, for anti-push-back function

		Nº
41	Left	823751
	Right	823752
51	Left	823753
	Right	823754

 **INFO**
L version: order left components.
R version: order right components.

[24] Pin, adjustable, for anti-pushback function

		Nº
Gasket compression adjustable	25	895977
	26	895984
	27	895989
	32	895994
	35.5	858629
	36	895999
	39.5	839049
	42	861551
	44	896002
	49	896005
	53.5	839048

[4] Only use the number of packers that is specified in the profile assessment.

Optional

Connecting rod for ECC-groove			
			Nº
3 m connecting rod	ECC-groove	1 Piece(s)	735102
6 m connecting rod	ECC-groove	1 Piece(s)	334665

[35] Brush holder	
	Nº
Brush holder	809520

	
< 1100	2
≥ 1100	3

[80] Tilt protection device; for application ranges SH:SW ≥ 2:1 up to max. 3:1; can only be used without control unit with Soft function.		 2
	Nº	
Tilt protection device	897049	



4.5 Diagram C

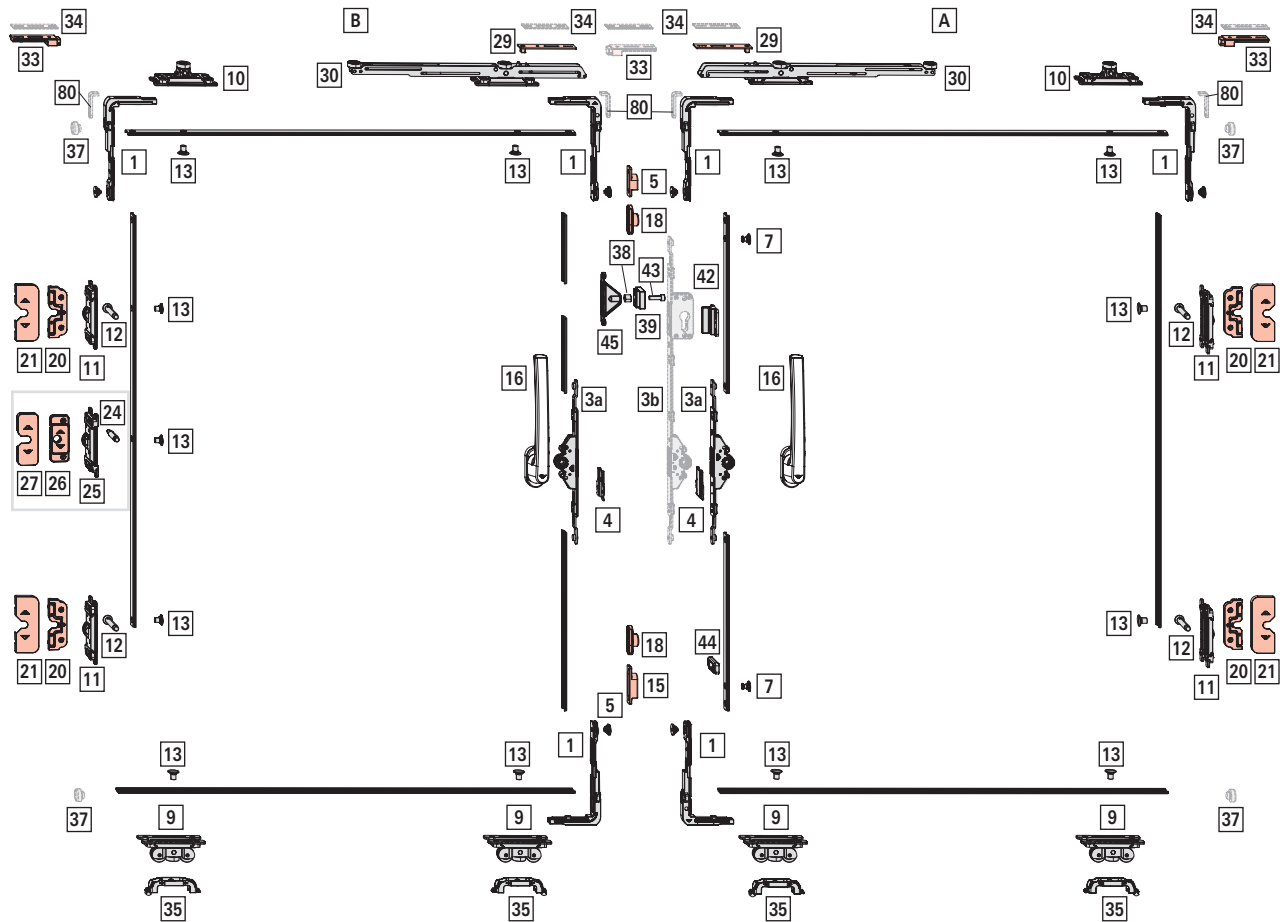


Fig. 4.5: Shown: [A] First opening sash L version; [B] Second opening sash R version; SW 900 mm; SH 1300 mm; espagnolette BS 25; control units with SoftClose



Application range

SW: 600 – 2000 mm

SH: 1000 – 2500 mm

S.kg: max. 250 kg

[1] Corner drive, reinforced

		Nº
–	–	781822

[3a] Flush-encased gearbox

			Nº
Flush-encased gearbox	15	280	817163
	25	280	625430
	30	280	625431
	35	280	625432
	40	280	625433

[4] FEG fixing, not compatible with flush-encased gearbox BS 15

	Nº
Fixing for flush-encased gearbox	809700

[5] Striker

	Nº
12.5	482260
14.4	744684
	
< 1400	1
1400 – 1970	2
> 1970	3

[7] Locking cam

	Nº
12.8	639931
15.5	757585
	
< 1400	2
1400 – 1970	3
> 1970	4

[9] Roller unit

		Nº
41	Left	821686
	Right	823733
51	Left	823734
	Right	823735
		
< 1100		4
≥ 1100		6

[10] Control unit, on the mullion side and in the centre → from page 65

Alternatively (on the mullion side):

Control unit set with Soft function (incl. actuator) → from page 65

 1-2

		Nº
41	Left	821685
	Right	823730
51	Left	823731
	Right	823732

[*] Control unit set with Soft function, on the locking side → from page 65

Alternatively:

[10] Control unit

Contents:

[*]		#
[29]	Activator	1
[30]	Control unit with Soft function	1

[11] Centre closer

		Nº
41	Left	821687
	Right	823736
51	Left	823737
	Right	823738

	
≤ 1200	4
1201 – 2400	6
> 2400	8

[12] MUL locking cam

	Nº
17.4	809611
19	2006942
20	808632
21.9	809613
23.9	794770
24.6	775929
26.5	839698
28	858555
29	2031030
30	814786
31.5	809772
32.8	809612
33.5	819884
34.4	771375
37.5	836782
38.4	809614
39	2006890
39.5	839428
40.5	896989
41.4	798976
44	2007049
46	817228
47.5	806839
53.5	837747

	Nº
55.5	861579
62.4	809625

	
≤ 1200	4
1201 – 2400	6
> 2400	8

[13] Control cam

	Nº
Control cam D8	835324

		
> 1400	≤ 1100	13
	> 1100	17
1400 – 2200	≤ 1100	15
	> 1100	19
> 2200	≤ 1100	17
	> 1100	21

[15] Striker to prevent incorrect operation

	Nº
Striker to prevent incorrect operation	822788

[16] Handle (200 mm handle length) → CTL_1 2

Recessed grip (43 mm distance), not sh. →  2 CTL_1

[18] Buffer 2

	Nº
14	635307
16.5	757701
17.5	757587

[20] MUL striker

	Nº
Screw-on	793493

	
≤ 1200	4
1201 – 2400	6
> 2400	8

[21] Cover cap for MUL striker

		Nº
R01.1	Natural silver	819632
R05.3	Medium bronze	819631
R06.2	Jet black	798979
R07.2	Traffic white	808054

	
≤ 1200	4
1201 – 2400	6
> 2400	8

[5] Only use the number of packers that is specified in the profile assessment.

[24] Pin for anti-pushback function 1

	Nº
18	839869
19	2006943
20	816147
28	858556
33	835327
34	822393
37.5	837714
38	820048
39	2006891
40.5	897022
46.5	833594
53.5	838965
55.5	861940

[25] Centre closer for anti-pushback function 1

		Nº
41	Left	821687
	Right	823736
51	Left	823737
	Right	823738



INFO

L version: order right components.

R version: order left components.

[26] Striker for anti-pushback function 1

	Nº
Striker for anti-pushback function	810279

[27] Cover cap for striker for anti-pushback function 1

		Nº
R01.1	Natural silver	828482
R05.3	Medium bronze	828483
R06.2	Jet black	809717
R07.2	Traffic white	819351

[33] Stopper, cannot be used in conjunction with a control unit with SoftOpen / SoftClose together with SoftStop on the mullion side / SoftStop on the locking side.  2

Alternatively:

[37] Rubber buffer → *from page 66*

	Nº
Stopper	800196

[34] Packer; profile-related quantity ^[5]

	Nº
Packer	800197



[*] Operating sequence control set 1
SH ≥ 1200 mm, profile-related

	Nº
40.5	834699
44	895828
50	821508

Contents:

[*]		#
[38]	Sleeve, profile-related	1
[39]	Stop, second opening sash	1
[42]	Stop, first opening sash	1
[43]	Cylinder screw, profile-related	1
[44]	Anti-lifting device	1
[45]	Coupling, profile-related	1

Alternatively

[3b] Flush-encased gearbox, lockable (alternative to 3a) 1

			Nº
Lockable flush-encased gearbox	25	525	811483
	30	525	811484
	35	525	811495
	40	525	811496

[5] Striker

	Nº
12.5	482260
14.4	744684

	
< 1600	1
1600 – 1970	2
> 1970	3

[7] Locking cam

	Nº
12.8	639931
15.5	757585

	
< 1600	2
1600 – 1970	3
> 1970	4

[11] Centre closer, adjustable

		Nº
41	Left	823751
	Right	823752
51	Left	823753
	Right	823754

	
≤ 1200	4
1201 – 2400	6
> 2400	8

[12] MUL locking cam, adjustable

		Nº
Gasket compression adjustable	25	895955
	26	895966
	27	895970
	32	786728
	34.5	2010069
	35.5	858628
	36	895972
	39.5	839047
	42	861550
	44	895973
	45.8	791838
	47.8	788696
	49	895974
	53.5	839045

	
≤ 1200	4
1201 – 2400	6
> 2400	8

[25] Centre closer, adjustable, for anti-push-back function 1

		Nº
41	Left	823751
	Right	823752
51	Left	823753
	Right	823754



INFO

L version: order right components.

R version: order left components.

[24] Pin, adjustable, for anti-pushback function 			
		Nº	
Gasket compression adjustable	25	895977	
	26	895984	
	27	895989	
	32	895994	
	35.5	858629	
	36	895999	
	39.5	839049	
	42	861551	
	44	896002	
	49	896005	
	53.5	839048	

Optional

Connecting rod for ECC-groove			
			Nº
3 m connecting rod	ECC-groove	1 Piece(s)	735102
6 m connecting rod	ECC-groove	1 Piece(s)	334665

[35] Brush holder	
	Nº
Brush holder	809520
	
< 1100	4
≥ 1100	6



4.6 Diagram C'

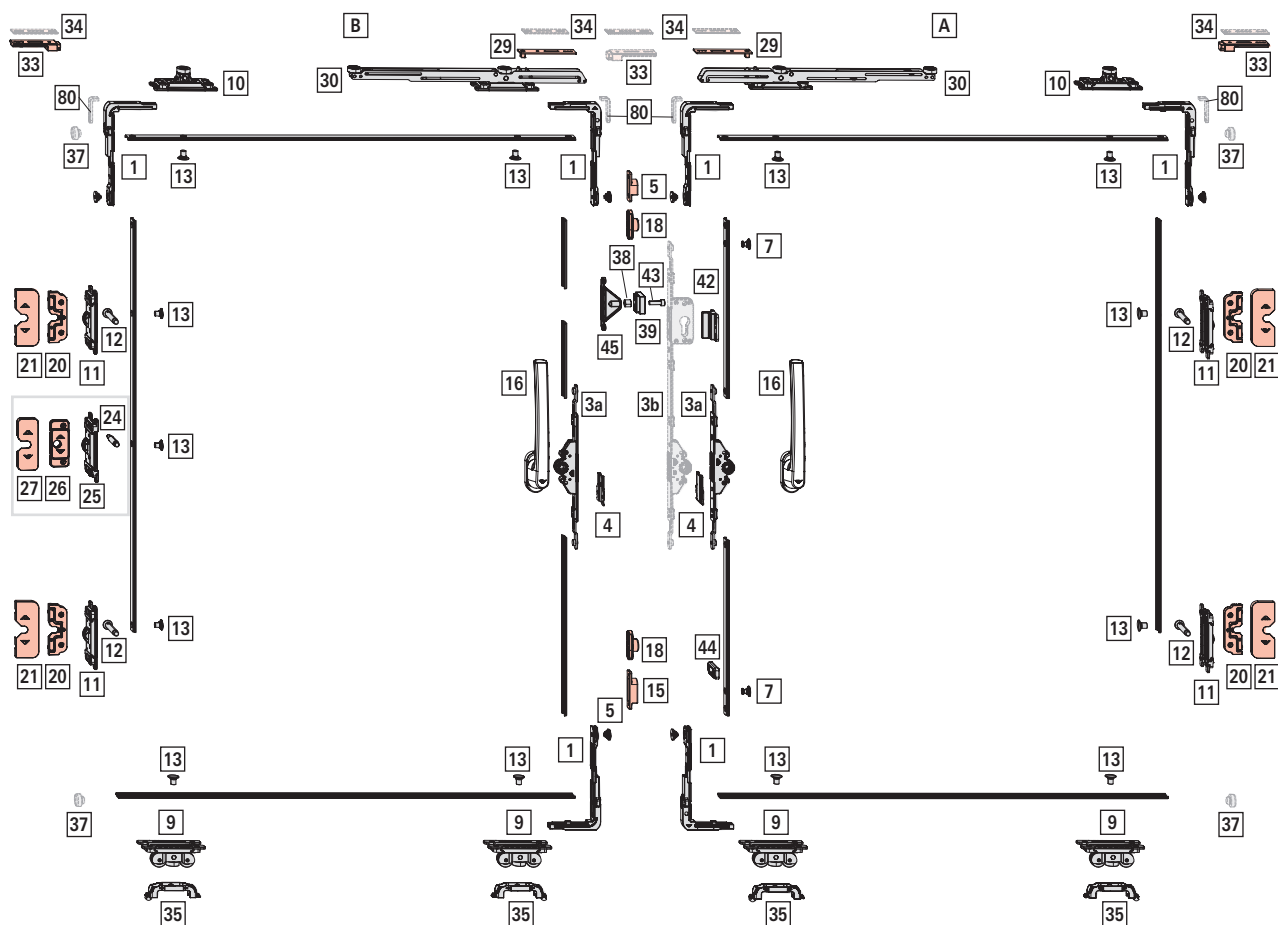


Fig. 4.6: Shown: [A] First opening sash L version; [B] Second opening sash R version; SW 900 mm; SH 1300 mm; espagnolette BS 25; control units with SoftClose



Application range

SW: 600 – 2000 mm

SH: 1000 – 2500 mm

S.kg: max. 250 kg

[1] Corner drive, reinforced 		
		Nº
–	–	781822

[3a] Flush-encased gearbox 			
			Nº
Flush-encased gearbox	15	280	817163
	25	280	625430
	30	280	625431
	35	280	625432
	40	280	625433

[4] FEG fixing, not compatible with flush-encased gearbox BS 15 	
	Nº
Fixing for flush-encased gearbox	809700

[5] Striker 	
	Nº
12.5	482260
14.4	744684
	
< 1400	1
1400 – 1970	2
> 1970	3

[7] Locking cam 	
	Nº
12.8	639931
15.5	757585
	
< 1400	2
1400 – 1970	3
> 1970	4

[9] Roller unit 		
		Nº
41	Left	821686
	Right	823733
51	Left	823734
	Right	823735
		
< 1100		4
≥ 1100		6



INFO

L version: order right components.

R version: order left components.



[10] Control unit, on the mullion side and in the centre → *from page 65*

Alternatively (on the mullion side):

Control unit set with Soft function (incl. activator) → *from page 65*



		Nº
41	Left	821685
	Right	823730
51	Left	823731
	Right	823732



INFO

L version: order right components.

R version: order left components.



[*] Control unit set with Soft function, on the locking side → *from page 65*

Alternatively:

[10] Control unit

Contents:



[*]		#
[29]	Activator	1
[30]	Control unit with Soft function	1



INFO

L version: order right components.

R version: order left components.



[11] Centre closer



		Nº
41	Left	821687
	Right	823736
51	Left	823737
	Right	823738



	
≤ 1200	4
1201 – 2400	6
> 2400	8



INFO

L version: order right components.

R version: order left components.

[12] MUL locking cam		
		Nº
17.4		809611
19		2006942
20		808632
21.9		809613
23.9		794770
24.6		775929
26.5		839698
28		858555
29		2031030
30		814786
31.5		809772
32.8		809612
33.5		819884
34.4		771375
37.5		836782
38.4		809614
39		2006890
39.5		839428
40.5		896989
41.4		798976
44		2007049
46		817228
47.5		806839
53.5		837747
55.5		861579
62.4		809625
		
≤ 1200		4
1201 – 2400		6
> 2400		8

[13] Control cam		
		Nº
Control cam D8		
		
> 1400	≤ 1100	13
	> 1100	17
1400 – 2200	≤ 1100	15
	> 1100	19
> 2200	≤ 1100	17
	> 1100	21

[15] Striker to prevent incorrect operation 	
	Nº
Striker to prevent incorrect operation	822788

[16] Handle (200 mm handle length) → CTL_1 
--

Recessed grip (43 mm distance), not sh. →  2

[18] Buffer 	
	Nº
14	635307
16.5	757701
17.5	757587

[20] MUL striker	
	Nº
Screw-on	793493
	
≤ 1200	4
1201 – 2400	6
> 2400	8

[21] Cover cap for MUL striker		
		Nº
		
R01.1	Natural silver	819632
R05.3	Medium bronze	819631
R06.2	Jet black	798979
R07.2	Traffic white	808054

	
≤ 1200	4
1201 – 2400	6
> 2400	8

[24] Pin for anti-pushback function 	
	Nº
18	839869
19	2006943
20	816147
28	858556
33	835327
34	822393
37.5	837714
38	820048
39	2006891
40.5	897022
46.5	833594
53.5	838965
55.5	861940

[25] Centre closer for anti-pushback function 		
		Nº
		
41	Left	821687
	Right	823736
51	Left	823737
	Right	823738



INFO

L version: order right components.
R version: order left components.

[26] Striker for anti-pushback function



Nº

Striker for anti-pushback function 810279

[27] Cover cap for striker for anti-pushback function



Nº

R01.1	Natural silver	828482
R05.3	Medium bronze	828483
R06.2	Jet black	809717
R07.2	Traffic white	819351

[33] **Stopper**, cannot be used in conjunction with a control unit with SoftOpen / SoftClose together with SoftStop on the mullion side / SoftStop on the locking side.

Alternatively:

[37] Rubber buffer → *from page 66*



Nº

Stopper 800196

[34] Packer; profile-related quantity ^[6]



Nº

Packer 800197

[*] Operating sequence control set 1 SH ≥ 1200 mm, profile-related



Nº

40.5	834699
44	895828
50	821508

Contents:

[*]



#

[38]	Sleeve, profile-related	1
[39]	Stop, second opening sash	1
[42]	Stop, first opening sash	1
[43]	Cylinder screw, profile-related	1
[44]	Anti-lifting device	1
[45]	Coupling, profile-related	1

Alternatively

[3b] Flush-encased gearbox, lockable (alternative to 3a)



Nº

Lockable flush-encased gearbox	25	525	811483
	30	525	811484
	35	525	811495
	40	525	811496

[6] Only use the number of packers that is specified in the profile assessment.

[5] Striker



Nº

12.5	482260
14.4	744684



< 1600	1
1600 – 1970	2
> 1970	3

[7] Locking cam



Nº

12.8	639931
15.5	757585



< 1600	2
1600 – 1970	3
> 1970	4

[11] Centre closer, adjustable



Nº

41	Left	823751
	Right	823752
51	Left	823753
	Right	823754



≤ 1200	4
1201 – 2400	6
> 2400	8



INFO

L version: order right components.
R version: order left components.

[12] MUL locking cam, adjustable

		Nº
Gasket compression adjustable	25	895955
	26	895966
	27	895970
	32	786728
	34.5	2010069
	35.5	858628
	36	895972
	39.5	839047
	42	861550
	44	895973
	45.8	791838
	47.8	788696
	49	895974
	53.5	839045

	
≤ 1200	4
1201 – 2400	6
> 2400	8

[25] Centre closer, adjustable, for anti-push-back function 1

		Nº
41	Left	823751
	Right	823752
51	Left	823753
	Right	823754



INFO

L version: order right components.

R version: order left components.

[24] Pin, adjustable, for anti-pushback function 1

		Nº
Gasket compression adjustable	25	895977
	26	895984
	27	895989
	32	895994
	35.5	858629
	36	895999
	39.5	839049
	42	861551
	44	896002
	49	896005
	53.5	839048

[35] Brush holder

	Nº
Brush holder	809520
	
< 1100	4
≥ 1100	6

Optional

Connecting rod for ECC-groove

			Nº
3 m connecting rod	ECC-groove	1 Piece(s)	735102
6 m connecting rod	ECC-groove	1 Piece(s)	334665

[80] Tilt protection device; for application ranges SH:SW ≥ 2:1 up to max. 3:1; can only be used without control unit with Soft function.  4

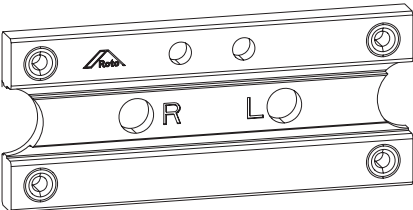
	Nº
Tilt protection device	897049



5 Jigs / tools

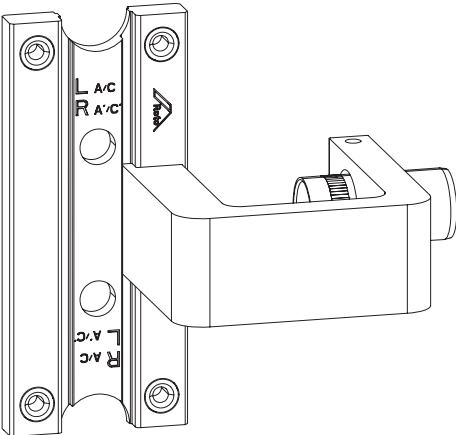
5.1 Drilling jigs

5.1.1 Roller unit / control unit



		Nº
	41	836947
	51	836945

5.1.2 Centre closer



INFO

Use of a drilling jig with Ø 14.0 is mandatory for the centre closer, adjustable.

For centre closer: Ø 12.0

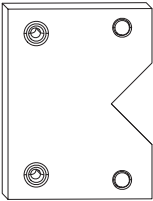
		Nº
	41	893970
	51	893743

For centre closer, adjustable: Ø 14.0

		Nº
	41	836942
	51	836941

5.1.3 Strikers

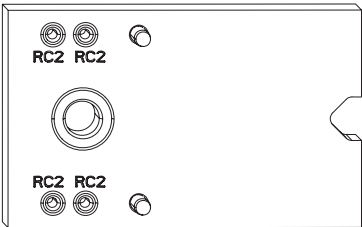
Mullion striker



INFO

Order drilling jigs depending on the profile used (see profile assessment).

Mullion security striker / striker for anti-pushback function



INFO

Order drilling jigs depending on the profile used (see profile assessment).

5.1.4 Drilling aid

For activator and stopper positioning jigs

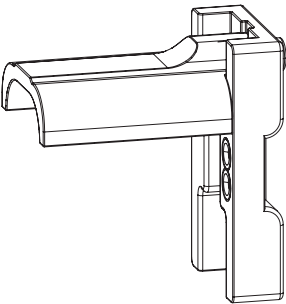


Nº

Drilling aid for roller track and guide track

778521

5.1.5 Tilt protection device



Top

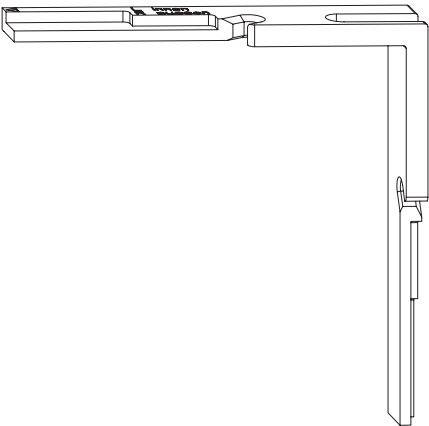
Nº

2000345



5.2 Marking jig

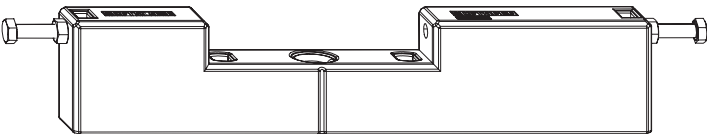
Striker and striker to prevent incorrect operation



		Nº
Striker marking jig	Espagnolette side	840276

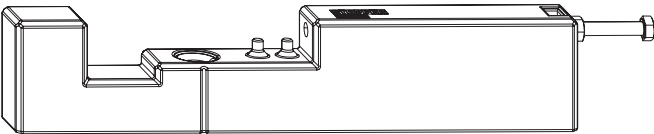
5.3 Positioning jigs

5.3.1 Activator



		Nº
Drilling jig for activator	Can be used with a centre screw fixing	2005536

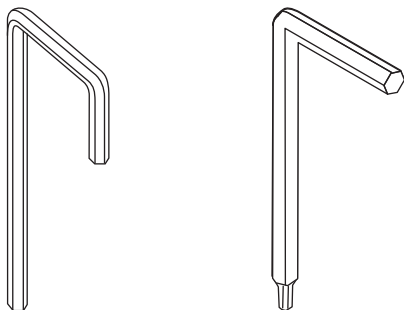
5.3.2 Stopper



		Nº
Drilling jig for stopper	Can be used with a centre screw fixing	2005537

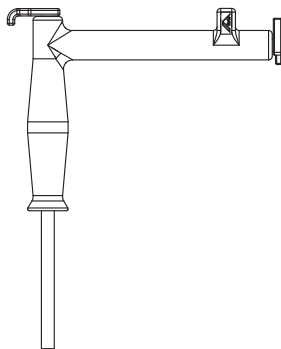
5.4 Tools

5.4.1 Hex key



		Nº
4 mm hex key		208609
Hex key: 2.5 / 4.0 mm		230764

5.4.2 Extractor handle



		Nº
Extractor handle for stay-bearing pin		899630
Replacement blade		230765

5.4.3 Tensioning tool

For control unit with soft function



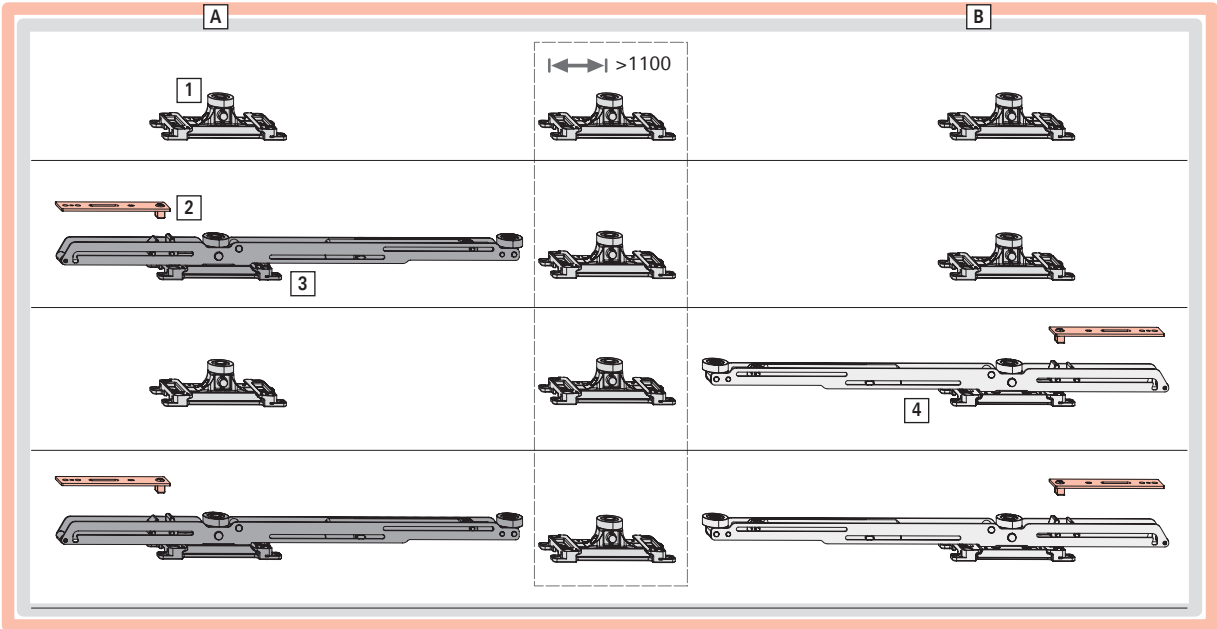
		Nº
Tensioning tool	For control unit with soft function	837763



6 Accessories

6.1 Control unit with Soft function

Positioning options for the control unit



- [A] On the locking side

[B] On the mullion side

[1] Control unit without Soft function
- [2] Activator for control unit with Soft function

[3] Control unit with SoftClose

[4] Control unit with SoftOpen

Control unit	Min. SW	Alignment	Position	Function
Without Soft function	600	–	On the espagnolette side, on the mullion side	–
	1100	–	Centred	Supports the sash
With SoftClose	620* / 880**	Additional control roller faces towards the centre of the sash	On the locking side	Damps the movement of the sash in the locking direction and draws it slowly closed.
With SoftOpen	620* / 880**	Additional control roller faces towards the centre of the sash	On the mullion side	Damps the movement of the sash in the opening direction and draws it slowly into the final position.

* Min. SW with one control unit with Soft function

** Min. SW with two control units with Soft function

Control unit set with SoftClose (incl. activator)

SW ≥ 620 mm

Installation position: at the top of the locking side

					Nº
Espagnolette side	41	100 kg	≤ 100 kg	Left	837235
				Right	837152
		200 kg	100 kg to 200 kg	Left	837236
				Right	837153
	51	100 kg	≤ 100 kg	Left	837241
				Right	837238
		200 kg	100 kg to 200 kg	Left	837242
				Right	837239

Accessories

Activator spare part for control unit with Soft function

Control unit set with SoftOpen (incl. activator)

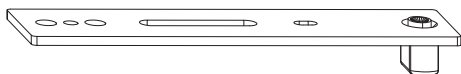
Installation position: at the top of the mullion side

					Nº
Mullion side	41	100 kg	<= 100 kg	Left	838569
				Right	838566
	51	200 kg	100 kg to 200 kg	Left	838570
				Right	838567
		100 kg	<= 100 kg	Left	838575
				Right	838572
		200 kg	100 kg to 200 kg	Left	838576
				Right	838573

Installation position: at the top of the mullion side

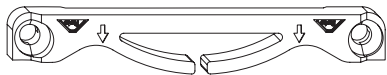
6.2 Activator spare part for control unit with Soft function

The activator for a centre screw fixing is included in the control unit set.



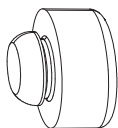
		Nº
Activator for soft function	Can be used with a centre screw fixing	837318

6.3 Centring unit for control unit with / without Soft function



	Nº
41	2027477
51	2027478

6.4 Rubber buffer



	Nº
16.5	780647
17.5	798249

6.5 End stop with packer

As an alternative to the rubber buffer

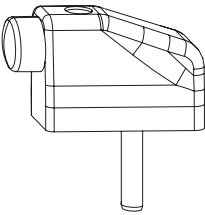


INFO

Pay attention to the profile assessment.



End stop



			Nº
End stop	RAL 7004	Signal grey	2006569
	RAL 9005	Jet black	349600

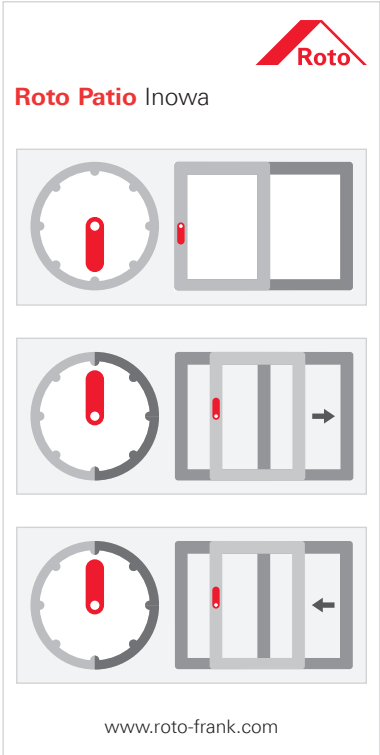
Support plate for end stop, profile-related



			Nº
Packer	RAL 7004	Signal grey	2007421
	RAL 9005	Jet black	477263

6.6 Label

Diagram A



	Nº
Label indicating the operating sequence, diagram A	811486

Diagram C

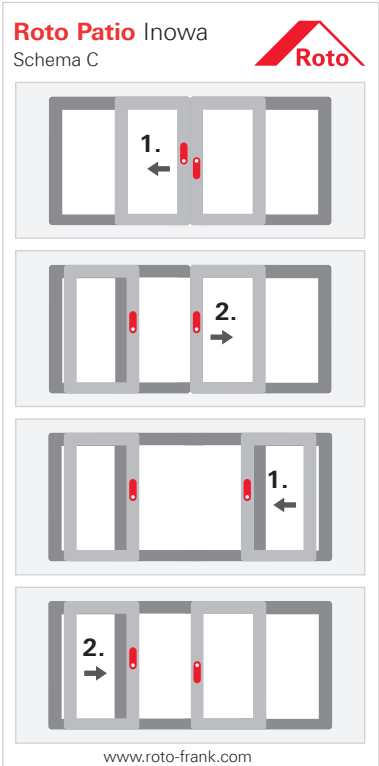


Fig. 6.1: Figure for installation of left version of first opening sash

Label indicating the operating sequence, diagram C			Nº
		Left	823251
		Right	823250



7 Brief instructions

7.1 Diagram A, A', K, K'

Summary of IMO 282

	Installation sequence	Note	Page reference
Sash	Prepare the connecting rods.	Observe the installation sequence → <i>from page 83.</i>	
	Install the locking and control cams.	Observe the installation sequence → <i>from page 83.</i>	→ <i>from page 79</i>
	Install the corner drives.	Observe the installation sequence → <i>from page 83.</i>	→ <i>from page 89</i>
	Install the flush-encased gearbox.	Observe the installation sequence → <i>from page 83.</i>	→ <i>from page 91</i>
	Install the handle.		→ <i>from page 95</i>
	Install the roller units.		→ <i>from page 96</i>
	Install the control units.	Alternatively: install the control unit with Soft function → <i>from page 65.</i>	→ <i>from page 98</i>
	Install the centre closers with mullion locking cams.		→ <i>from page 100</i>
Joining the sash and frame	Insert the sash.	Move the handle to the open sliding position. Screw down the operator track.	→ <i>from page 108</i>
Frame	Install strikers.		→ <i>from page 112</i>
	Install the striker to prevent incorrect operation.		→ <i>from page 113</i>
	Install the mullion strikers.		→ <i>from page 115</i>
	Install the activator.	Only when using a control unit with Soft function. Quantity of packers = $(Y-38) / 2$ → <i>from page 118.</i>	→ <i>from page 118</i>
	Tension the control unit with Soft function .	Only tension the control unit with soft function using a tensioning tool.	→ <i>from page 123</i>
	Install the buffer.		
	Install the stopper or rubber buffer.	Version 1: operator track stopper Version 2: sash rubber buffer Place pressure-proof packers under the cover on the mullion side.	→ <i>from page 129</i> → <i>from page 106</i>
Final acceptance	Install the element.	Place supports under the threshold every 300 mm across its entire area. Max. permitted unevenness of the entire threshold: 3 mm. We recommended that you place supports under the threshold across its entire area.	→ <i>from page 132</i>
	Adjust the hardware.		→ <i>from page 144</i>
	Lubricate the hardware.		→ <i>from page 149</i>
	Check the handle operating torque.	Operating torque ≤ 10 Nm	
	Remove all protective films on aluminium profiles.		

8 Installation

8.1 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.



8.2 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.

8.2.1 Overview



WARNING

Incorrect screw connections may pose a risk of death!

Hardware components can be pulled out of the sash if they are not screwed through a profile wall that is at least 6 mm thick in total or screwed down using rivet nuts.

- Select the length of the screws so that they will hold in the aluminium profile. Alternatively, insert additional aluminium profiles.



WARNING

Incorrect screw connections may pose a risk of death!

Short screws will not reach the steel reinforcement and will therefore not hold.

Hardware components can be pulled out of the sash if they are not screwed into the steel reinforcement.

- Select the length of the screws so that they will hold in the steel reinforcement.



ATTENTION

Property damage due to choosing the wrong screws!

Self-drilling screws may damage important functional elements of a component when screwed in.

- Use screws without a self-tapping thread.



ATTENTION

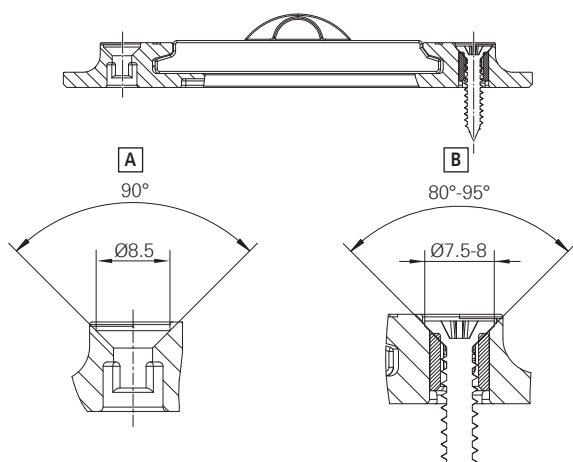
Protruding screw heads may cause property damage.

Protruding screw heads can damage adjoining materials.

- Tighten screw heads until they are flush with the surface.

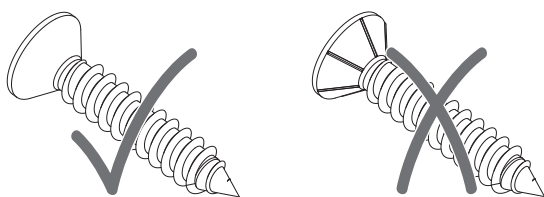
Components	Quantity	Size	Diameter to be drilled	Drive
Corner drive, reinforced	2	ST4.2 x ...	3.5	Cross-head
Roller unit	4	ST4.2 x ...	3.5	Cross-head
Control unit	4	ST4.2 x ...	3.5	Cross-head
Centre closer	4	ST4.2 x ...	3.5	Cross-head
Mullion striker / striker for anti-pushback function	2	ST4.2 x ...	3.5	Cross-head
Mullion security striker	4	ST4.2 x ...	3.5	Cross-head
Striker / stop	2	ST4.2 x ...	3.5	Not specified
SEC striker	2	ST4.2 x ...	3.5	Cross-head
Activator / stopper	3	ST4.2 x ...	3.5	Cross-head
Roto Line handle	2	M5 x ...	10.0 / 12.0	Cross-head

Specifications for selecting screws



[A] Specifications relating to the countersink

[B] Specifications relating to the screw head for selecting screws



ATTENTION

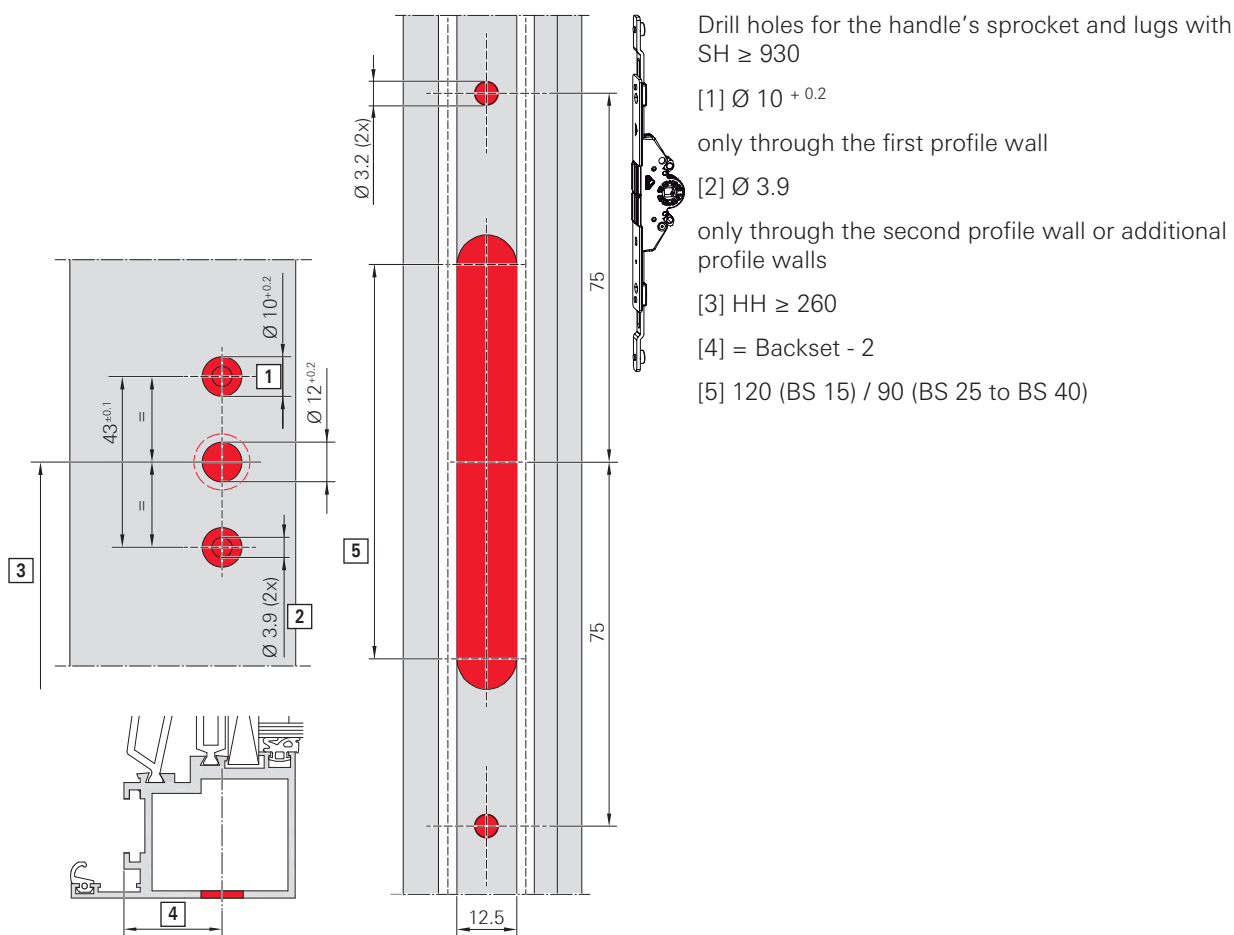
Property damage due to inserting screws with ribs on the underside of the screw head!

Ribs on the underside of the screw head may damage important functional elements of a component when screwed in.

- Use screws with screw heads which do not have ribs on the underside.

8.3 Drilling and routing dimensions

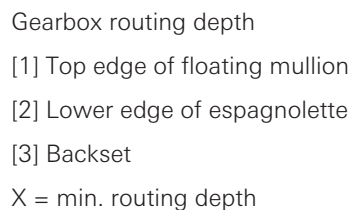
8.3.1 Flush-encased gearbox without profile cylinder



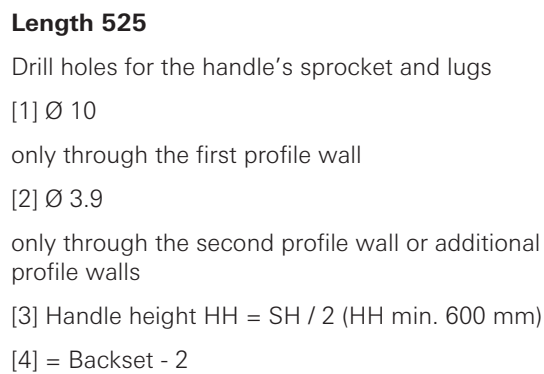
Installation

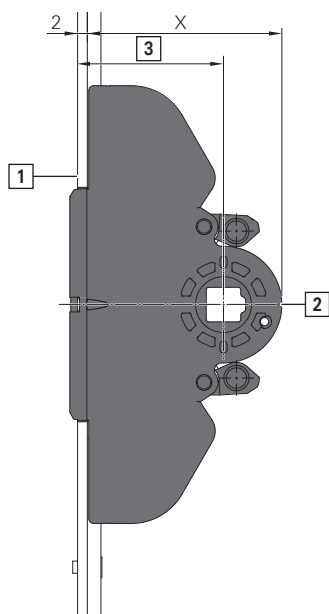
Drilling and routing dimensions

Flush-encased gearbox with profile cylinder



8.3.2 Flush-encased gearbox with profile cylinder





Gearbox routing depth

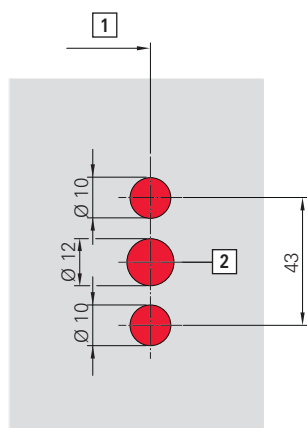
[1] Top edge of floating mullion

[2] Bottom edge of espagnolette

[3] Backset

X = min. routing depth

8.3.3 Roto Line



Drill holes for the handle's sprocket and lugs

[1] Backset

[2] Handle height

Drill hole Ø 10: drilling depth = overlap height + 16 mm for countersunk screws
 (ISO 7046-1 M5 x ...)

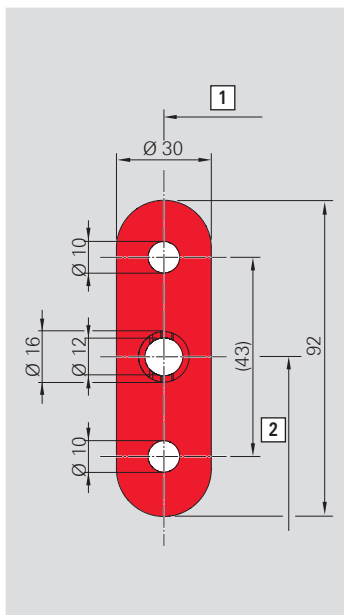
Drill hole Ø 12: drilling depth = overlap height + 16 mm for countersunk screws
 (ISO 7046-1 M5 x ...)

Installation

Drilling and routing dimensions

External recessed grip

8.3.4 External recessed grip



Recessed grip routing

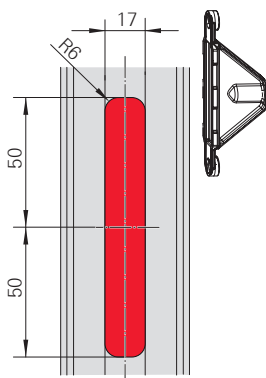
Routing depth = 10 mm

[1] Backset

[2] Handle height

8.3.5 Coupling

Diagram C



Routing for coupling in aluminium strip



INFO

Pay attention to the profile assessment.



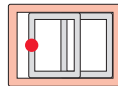
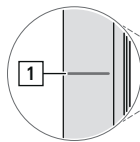
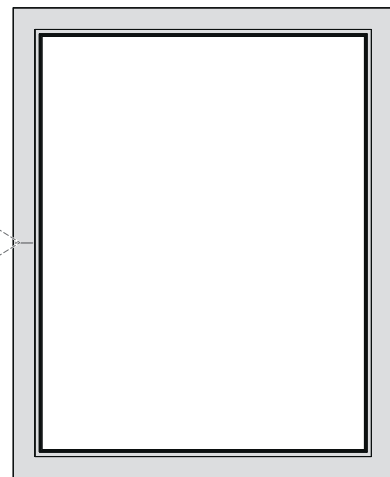
8.4 Sash

8.4.1 Preparing the sash for the flush-encased gearbox

8.4.1.1 Handle drillings

Creating the drillings for the handle

1. Mark the handle-height position on the inside of the sash [1].



2. Create the drillings.
Note any different drilling dimensions. → 8.3
"Drilling and routing dimensions" from page 73
3. Deburr the drillings.

8.4.1.2 Gearbox cutout

Routing the gearbox cutout

1. Route the espagnolette cutout.
Observe the routing dimensions. → 8.3 "Drilling and routing dimensions" from page 73
2. Deburr the espagnolette cutout.

8.4.1.3 Gearbox cutout with lock casing

Routing the gearbox cutout with lock casing

1. Route the espagnolette cutout.
Observe the routing dimensions. → 8.3 "Drilling and routing dimensions" from page 73
2. Deburr the espagnolette cutout.

8.4.2 Preparing the connecting rods



INFO

Comply with the installation sequence for the aluminium sash → *from page 83*.

Cropping

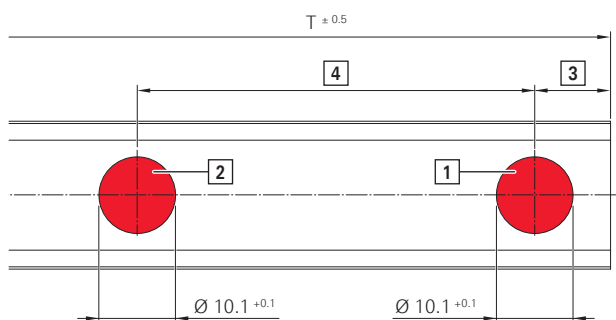


INFO

All connecting rod dimensions CR ± 0.5 mm.

1. For the length of the connecting rods, see the installation drawing. → *from page 133*
2. Mark the length on the connecting rods.
3. Crop the connecting rods.

Drilling / punching



Position	Description
[1]	Drill hole for coupling point
[2]	Drill hole for locking cam / control cam
[3]	Position dimension for coupling point / control cam
[4]	Position dimension for locking cam / control cam

1. For the number and position of the coupling points / locking cams / control cams, see the installation drawing → *from page 133*.
2. Drill / punch holes.

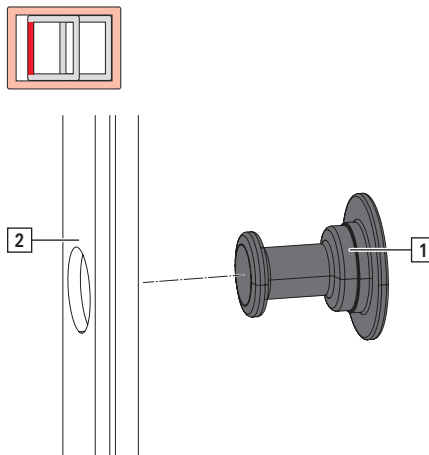


8.4.3 Locking and control cams

Installing the locking cams

⇒ Connecting rods prepared → *from page 78.*

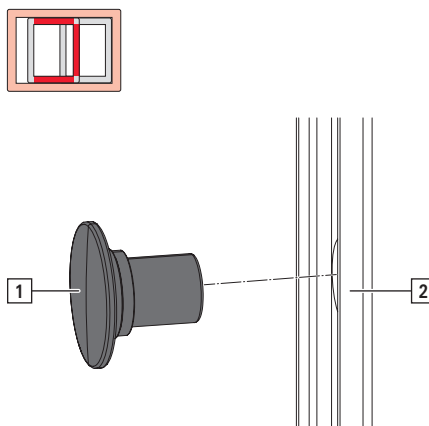
1. Insert the locking cams [1] into the connecting rods [2].



Installing the control cams

⇒ Connecting rods prepared → *from page 78.*

1. Insert the control cams [1] into the connecting rods [2].

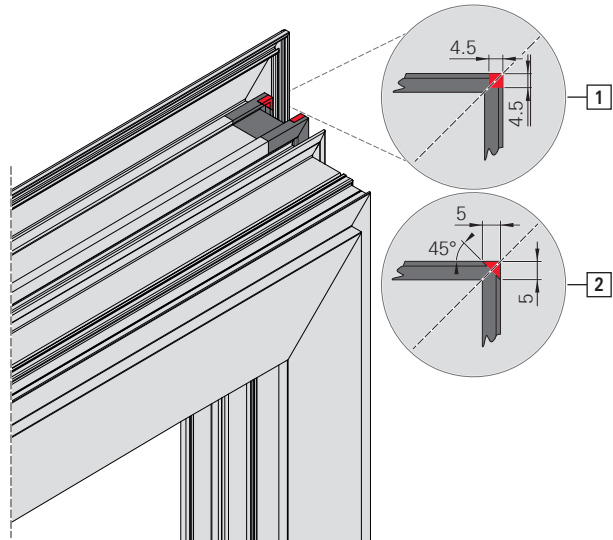


8.4.4 Opening the sash corners



1. Open the connecting rod groove at all sash corners.

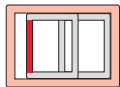
Position	Description
[1]	Connecting rod groove opening
[2]	Alternative connecting rod groove opening



2. Deburr the edges.



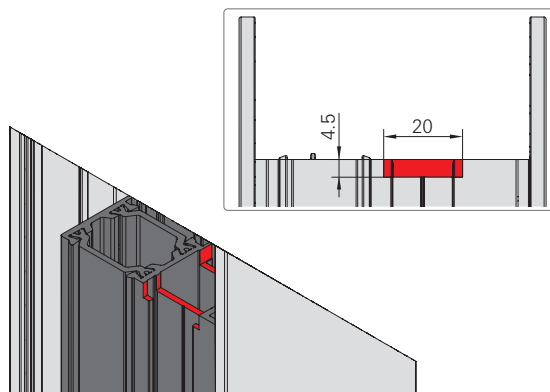
8.4.5 Sash adapter profile



Version 1: notching the adapter profile

⇒ The adapter profile has just been cropped (length = frame external height - 158).

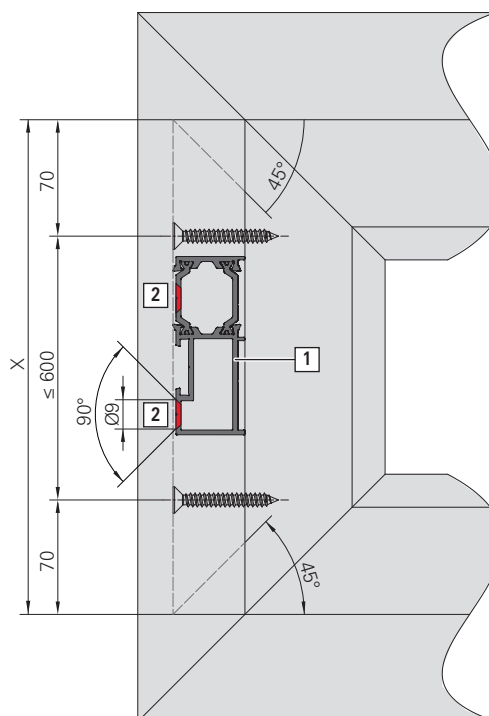
1. Notch the adapter profile (if present) at the top and bottom of the sash in the area of the corner drive.



Version 2: route the adapter profile

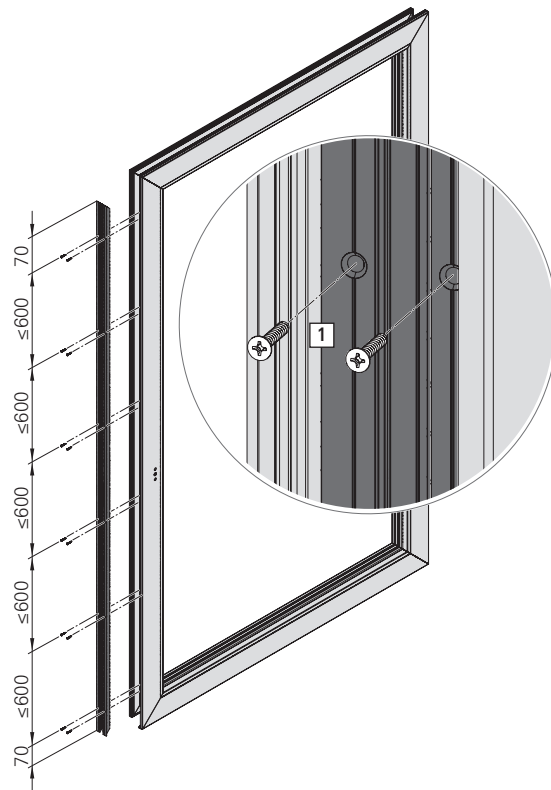
Customer-specific

1. Crop the adapter profile [1] at a 45° angle.
 Predrill and countersink the adapter profile on both outer notches [2].
 Drill: Ø 4.5



Installing the adapter profile

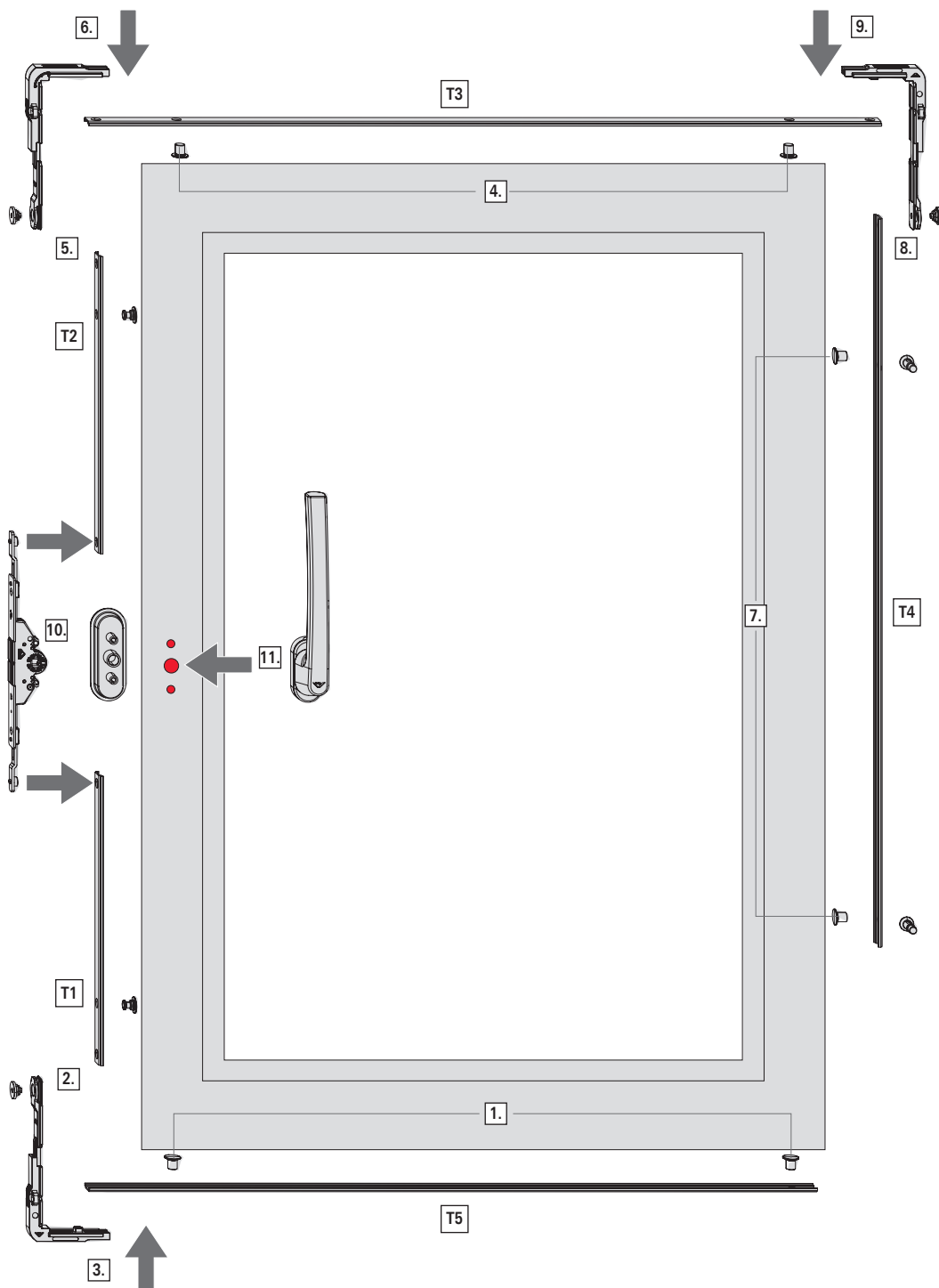
1. Place the adapter profile in the centre of the sash groove.
Align the adapter profile so that it is parallel with the sash groove.
Fasten the adapter profile in all predrilled holes using screws [1].





8.4.6 Installation sequence

8.4.6.1 Diagram A, A', K, K'



1. Insert the control cam into connecting rod CR5.
 Insert everything jointly into the connecting rod groove at the bottom.
2. Connect the corner drive to connecting rod CR1 and the locking cam at the coupling point → 8.4.3 "Locking and control cams" from page 79.
 Insert everything jointly into the connecting rod groove at the bottom on the locking side.

3. Secure the corner drive to the sash with two screws → *8.4.7 "Corner drive, reinforced" from page 89.*
4. Insert the control cam into connecting rod CR3.
Insert everything jointly into the connecting rod groove at the top.
5. Connect the corner drive to connecting rod CR2 and the locking cam at the coupling point → *8.4.3 "Locking and control cams" from page 79.*
Insert everything jointly into the connecting rod groove from above on the locking side.
6. Secure the corner drive to the sash with two screws → *8.4.7 "Corner drive, reinforced" from page 89.*
7. Insert the control cam into connecting rod CR4.
8. Connect the corner drive to connecting rod CR4 and the control cam at the coupling point.
Insert everything jointly into the connecting rod groove at the top on the hinge side.
9. Secure the corner drive to the sash with two screws → *8.4.7 "Corner drive, reinforced" from page 89.*
10. Place the flush-encased gearbox on connecting rods CR1 and CR2 on the locking side and connect it to the coupling points.
Screw down the espagnolette using screws .
11. Install the handle and recessed grip → *8.4.11 "Handle and recessed grip" from page 95.*



INFO

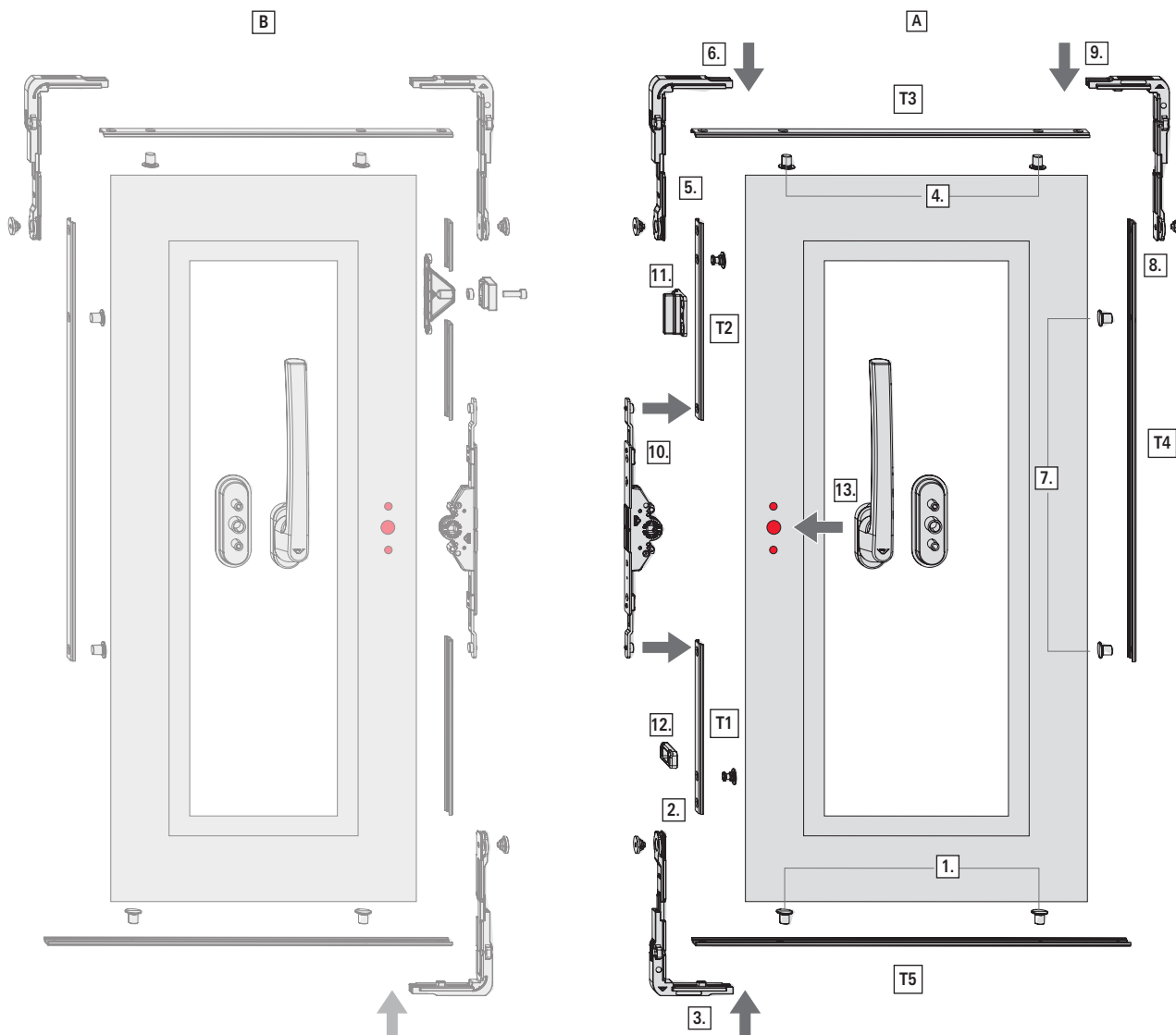
After installation, break the centre fixing on the espagnolette by turning the handle 180°.

Turn the handle to the open sliding position.



8.4.6.2 Diagram C, C'

First opening sash



[A] First opening sash

[B] Second opening sash

1. Insert the control cam into connecting rod CR5.
 Insert everything jointly into the connecting rod groove at the bottom.
2. Connect the corner drive to connecting rod CR1 and the locking cam at the coupling point → 8.4.3 "Locking and control cams" from page 79.
 Insert everything jointly into the connecting rod groove at the bottom on the locking side.
3. Secure the corner drive to the sash with two screws → 8.4.7 "Corner drive, reinforced" from page 89.
4. Insert the control cam into connecting rod CR3.
 Insert everything jointly into the connecting rod groove at the top.

5. Connect the corner drive to connecting rod CR2 and the locking cam at the coupling point. → *8.4.3 "Locking and control cams" from page 79*
Insert everything jointly into the connecting rod groove from above on the locking side.
6. Secure the corner drive to the sash with two screws → *8.4.7 "Corner drive, reinforced" from page 89.*
7. Insert the control cam into connecting rod CR4.
8. Connect the corner drive to connecting rod CR4 and the control cam at the coupling point.
Insert everything jointly into the connecting rod groove at the top on the hinge side.
9. Secure the corner drive to the sash with two screws → *8.4.7 "Corner drive, reinforced" from page 89.*
10. Place the flush-encased gearbox on connecting rods CR1 and CR2 on the locking side and connect it to the coupling points.
Screw down the espagnolette using screws .
11. Position the stop, first opening sash (see installation drawing).
Inward running sashes: arrow must point towards the handle.
Outward running sashes: arrow must point away from the handle.
Secure with four screws.
12. Position the anti-jemmy device (see installation drawing). The slope must be facing the handle.
Fasten with two screws.
13. Install the handle and recessed grip → *8.4.11 "Handle and recessed grip" from page 95.*

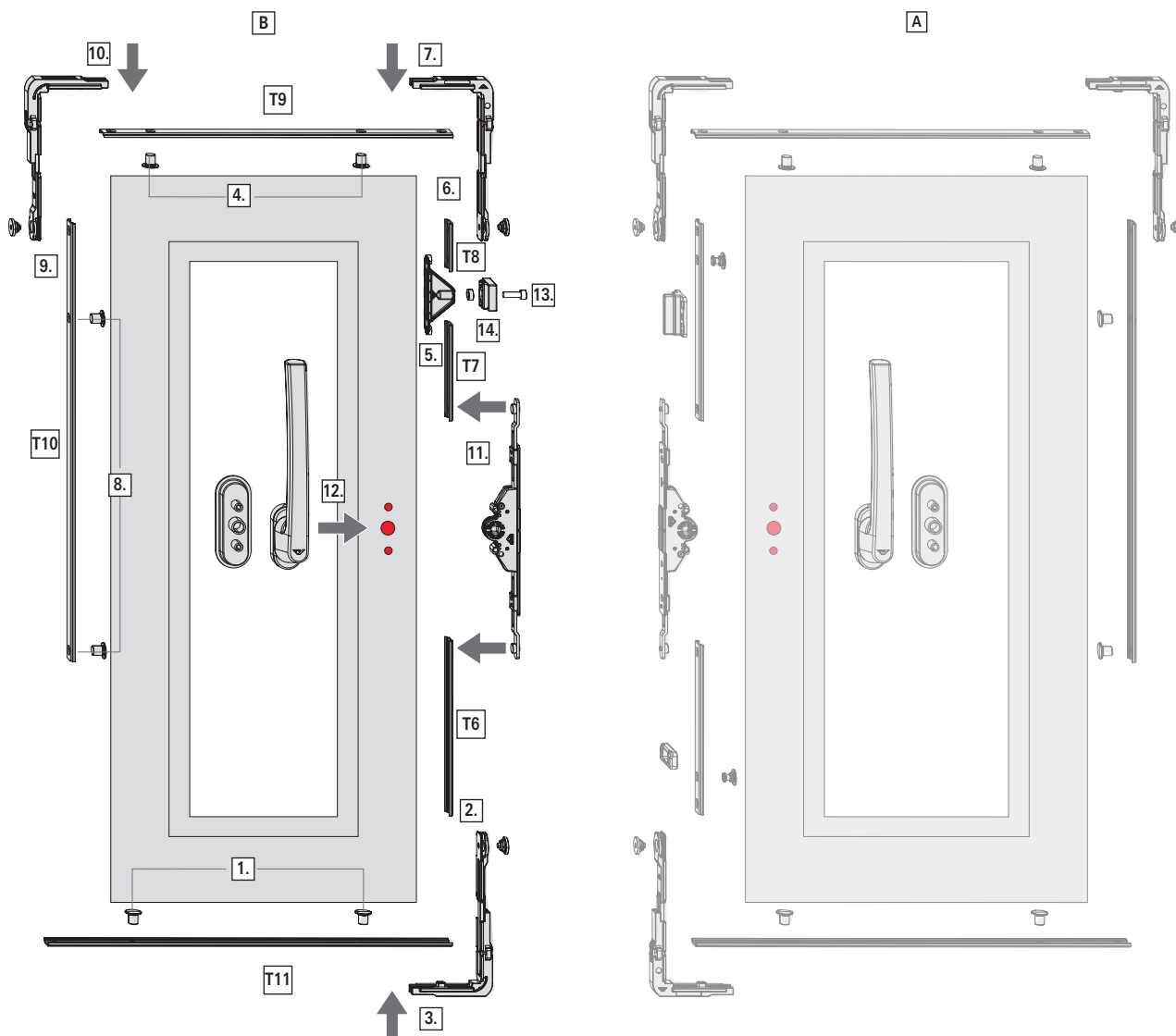


INFO

After installation, break the centre fixing on the espagnolette by turning the handle 180°.
Turn the handle to the open sliding position.



Second opening sash



[A] First opening sash
 [B] Second opening sash

1. Insert the control cam into connecting rod CR11.
 Insert everything jointly into the connecting rod groove at the bottom.
2. Connect the corner drive to connecting rod CR6 at the coupling point.
 Insert everything jointly into the connecting rod groove at the bottom on the locking side.
3. Secure the corner drive to the sash with two screws → 8.4.7 "Corner drive, reinforced" from page 89.
4. Insert the control cam into connecting rod CR9.
 Insert everything jointly into the connecting rod groove at the top.
5. Connect the coupling to connecting rods CR7 and CR8 at the coupling point.
6. Connect the corner drive to connecting rod CR8 at the coupling point.
 Insert everything jointly into the connecting rod groove from above on the locking side.

7. Secure the corner drive to the sash with two screws → *8.4.7 "Corner drive, reinforced" from page 89.*
8. Insert the control cam into connecting rod CR10.
9. Connect the corner drive to connecting rod CR10 and the control cam at the coupling point.
Insert everything jointly into the connecting rod groove at the top on the hinge side.
10. Secure the corner drive to the sash with two screws → *8.4.7 "Corner drive, reinforced" from page 89.*
11. Place the flush-encased gearbox on connecting rods CR6 and CR7 on the locking side and connect it at the coupling points.
Screw down the espagnolette using screws .
12. Install the handle and recessed grip → *8.4.11 "Handle and recessed grip" from page 95.*

**INFO**

After installation, break the centre fixing on the espagnolette by turning the handle 180°.

Turn the handle to the open sliding position.

13. Attach the stop, second opening sash to the screw (from the scope of delivery).
Attach the sleeve to the screw and sink it into the stop, second opening sash.
Screw onto coupling.



8.4.7 Corner drive, reinforced

Installing reinforced corner drives

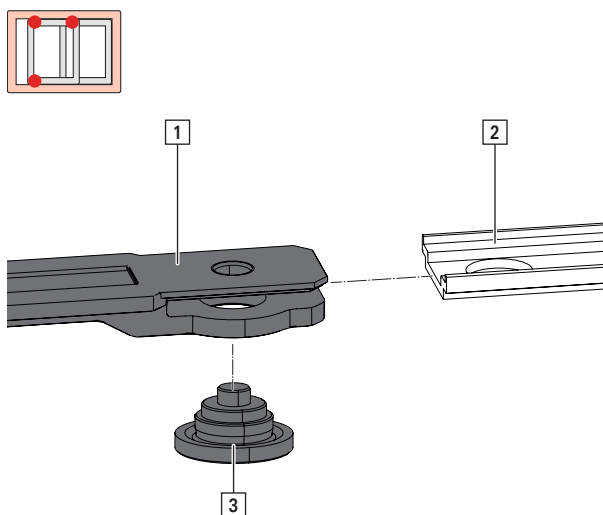


PRECONDITION

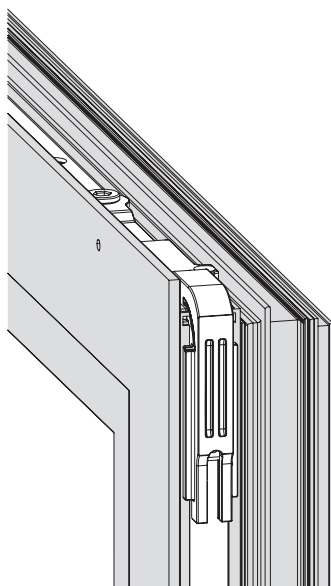
- Drill holes created in the handle → *from page 73*
- Espagnolette cutout routed → *from page 73*
- Sash corners opened → *from page 80*
- Connecting rods prepared
- Insertable cams installed → *from page 79*

1. Connect the corner drive [1] to the connecting rod [2] and additional components at the coupling point using the special screw [3].

Tool: size 4 hex key



2. Insert everything jointly into the connecting-rod groove.

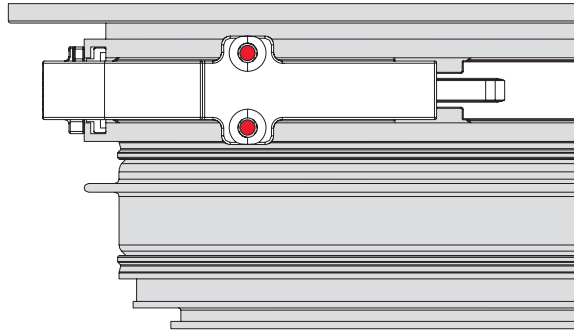


Installation

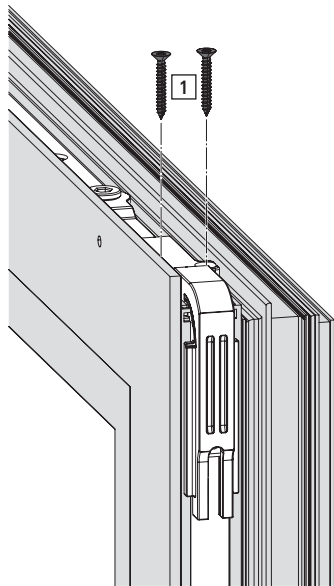
Sash

Corner drive, reinforced

3. Drill holes through the corner drive in the sash using a $\varnothing 3.5$ drill.



4. Fasten the corner drive to the sash with two screws [1].





8.4.8 Flush-encased gearbox

Installing the flush-encased gearbox

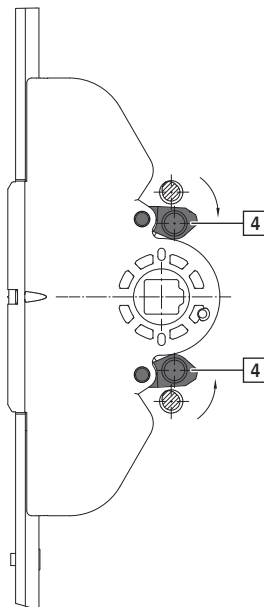


INFO

Comply with the installation sequence for the aluminium sash → *from page 83*.

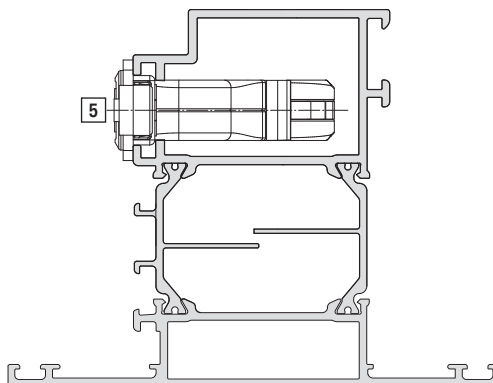
Connecting rods with corner drives are installed.

1. For a screw fixing with an exterior handle, swivel the threaded eyes [4] on the flush-encased gearbox inwards.



2. Place the flush-encased gearbox on the connecting rods on the locking side and connect it to the connecting rods at the coupling points.

3. Fasten the espagnolette with two screws [5].



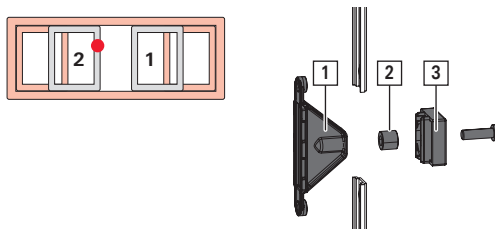
8.4.9 Diagram C components on the locking side

For the position of the components, see installation drawing diagram C → *from page 133*

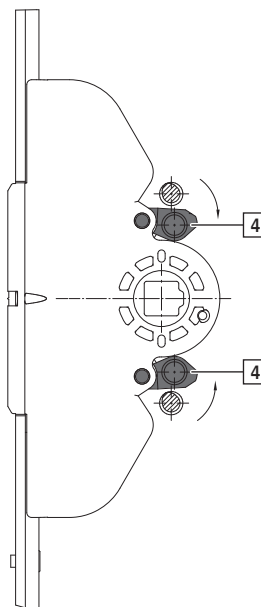
Second opening sash

1. Connect the reinforced corner drive to connecting rod T8 at the coupling point .

2. Connect the coupling [1] to connecting rods T7 and T8. Insert the sleeve [2] into stop of the second opening sash [3] and screw to the coupling with a cylinder screw.



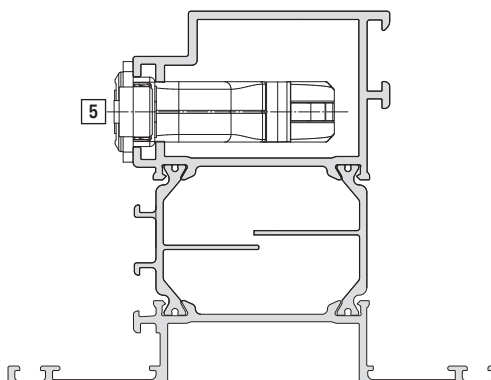
3. For a screw fixing with an exterior handle, swivel the threaded eyes [4] on the flush-encased gearbox inwards.



4. Place the flush-encased gearbox on connecting rods T6 and T7 on the locking side and connect it at the coupling points.

5. Insert everything jointly into the connecting-rod groove from above on the locking side.

6. Fasten the espagnolette to the floating mullion using two screws [5].





First opening sash

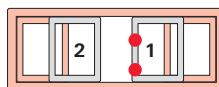
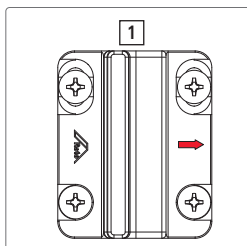
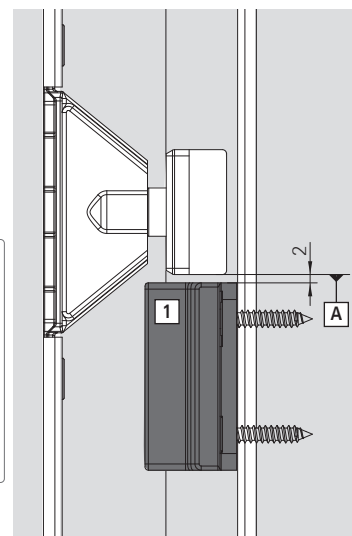
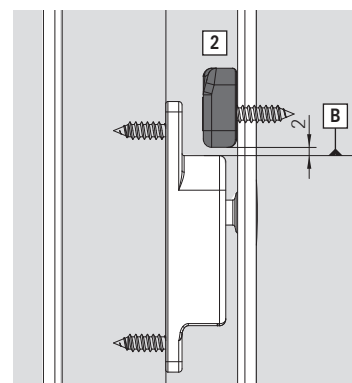
⇒ Strikers installed in the floating mullion.

1. Push the first opening sash shut until the lower edge [A] of the stop for the second opening sash can be transferred to the first opening sash.

Open the first opening sash again and position the stop for the first opening sash [1] on the first opening sash, at an offset of 2 mm from the lower edge of the stop for the second opening sash. While doing so, ensure that the arrow is pointing inwards. Fasten with four screws.

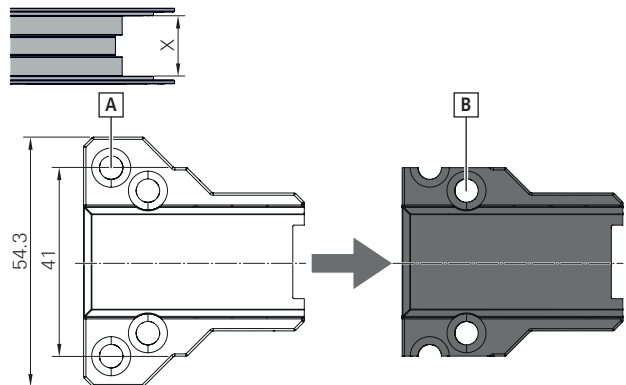
Push the first opening sash shut until the top edge [B] of the first striker at the bottom can be transferred to the second opening sash.

Open the first opening sash again and fasten the anti-lifting device [2] to the second opening sash with two screws, at an offset of 2 mm from the top edge of the striker.



8.4.10 Flush-encased gearbox fixing

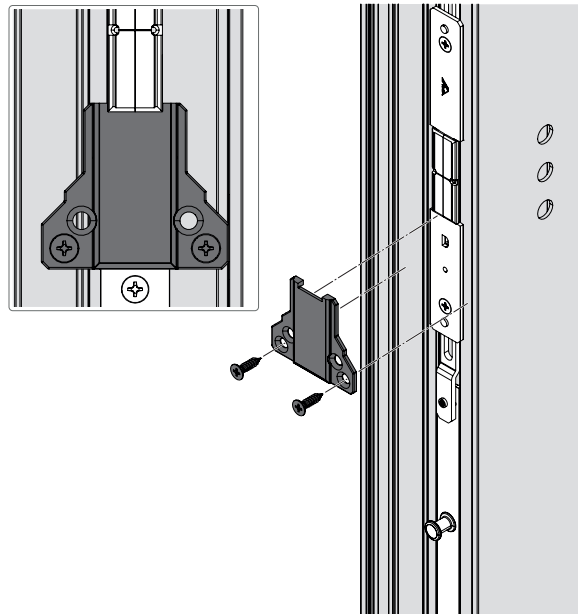
1. For sash profiles where $X < 55$ mm, crop the fixing to make it 41 mm wide.



[A] Drill holes where $X \geq 55$ mm

[B] Drill holes where $X < 55$ mm

2. Place the fixing in the centre, above the gearbox of the flush-encased gearbox and position it so that the recess is on the gearbox.
Fasten with two screws.

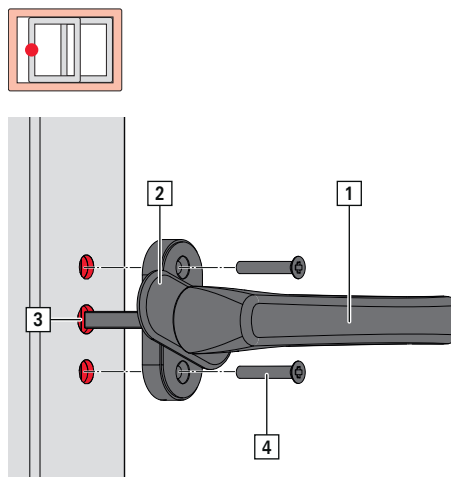




8.4.11 Handle and recessed grip

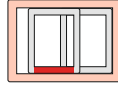
Installing the handle and recessed grip

1. Move the handle [1] to the 90° position → 11.1.1 "Roto Patio Inowa" from page 146.
2. Turn the escutcheon cover [2] in order to expose the screw holes.



3. Insert the handle into the sash [3].
4. Insert the recessed grip 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 expose the screw holes.

8.4.12 Roller unit



INFO

No spacer blocking for load transfer via the middle roller unit.

Positioning the drilling jig



ATTENTION

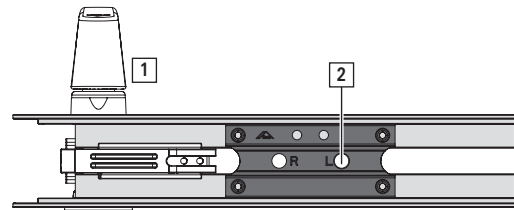
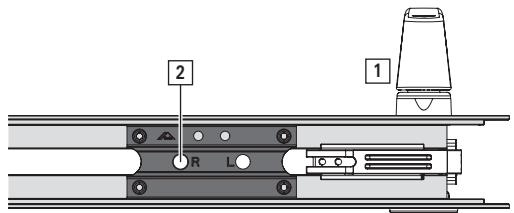
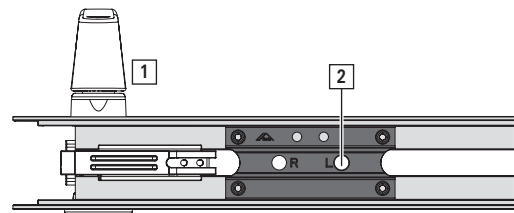
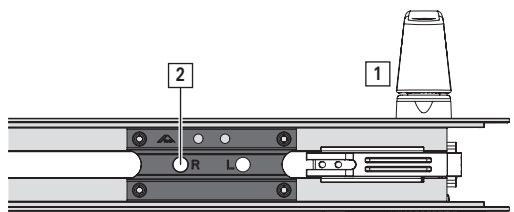
Improper drilling work may cause property damage.

An incorrect handle position and incorrect alignment of the drilling jig damage the sash during drilling.

- The handle must be in the sliding position [1].

Attach the drilling jig to the control cam [2].

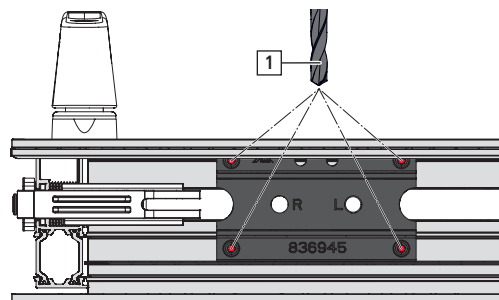
Refer to the installation drawing for the position → *from page 133*.



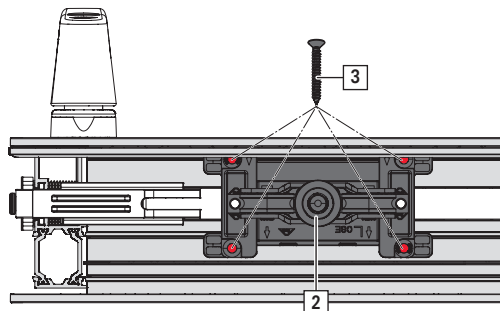


Installing the roller units

1. Drill the holes [1].
Drill: Ø 3.5
Shown: diagram A, L version

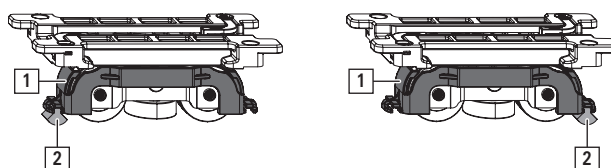


2. Insert the roller unit [2] and fasten with screws [3].

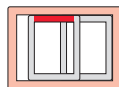


Fitting the brush holder

1. Attach the brush holder [1] on the roller unit, ensuring that the brushes [2] are positioned opposite one another and face outwards.

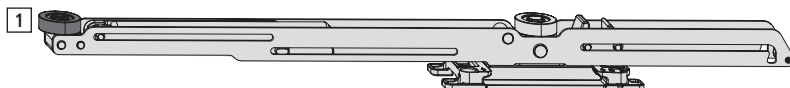


8.4.13 Control unit



INFO

For control units with Soft function, ensure that the additional control roller [1] is facing towards the centre of the sash during installation .



Positioning the drilling jig

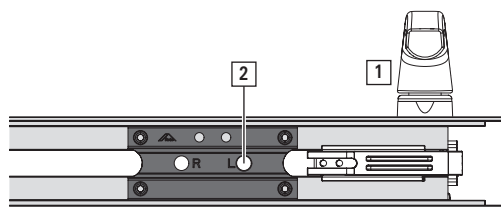
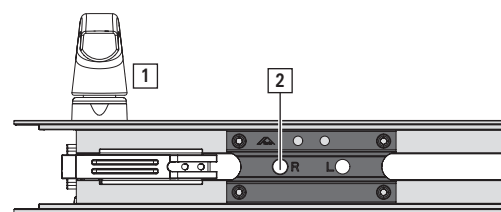
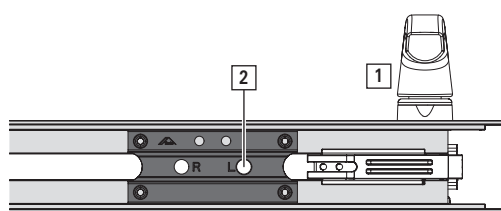
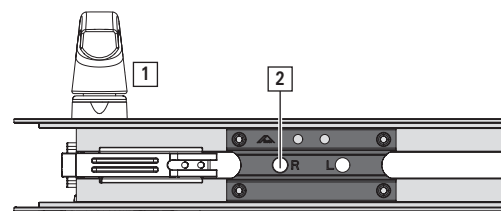


ATTENTION

Improper drilling work may cause property damage.

An incorrect handle position and incorrect alignment of the drilling jig damage the sash during drilling.

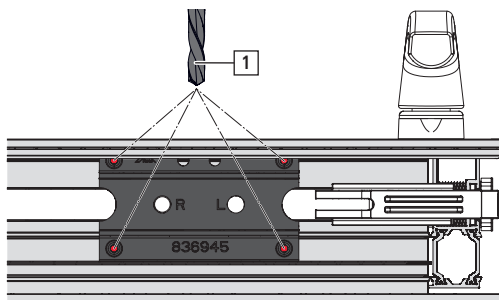
- The handle must be in the sliding position [1].



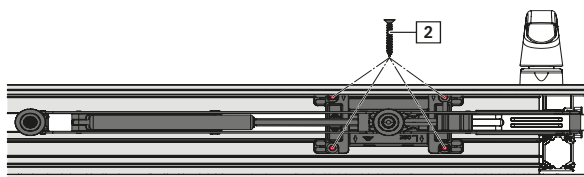


Installing the control unit

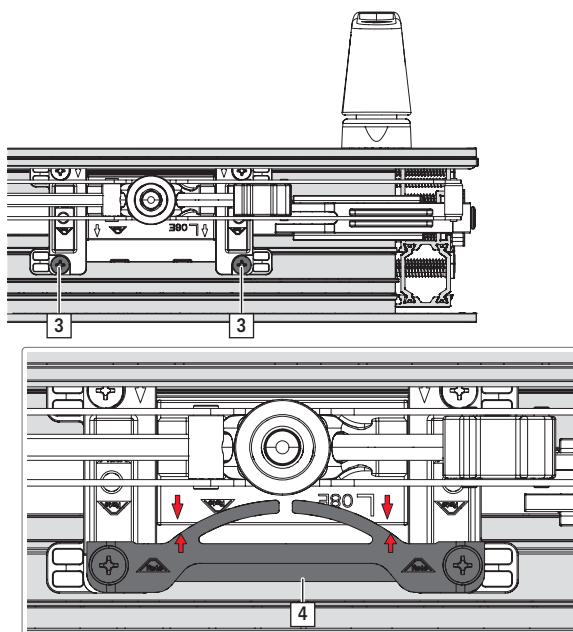
1. Drill the holes [1].
Drill: Ø 3.5
Shown: diagram A, L version



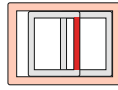
2. Insert the control unit and fasten with screws [2].



3. Optional:
Move the handle to the closed position.
Remove the two accessible screws [3].
Use locating aids to position the centring unit [4]
on the control unit. The arrows on the centring unit
and on the control unit point towards each other.
Fasten to the control unit with two longer screws
(min. 25 mm).



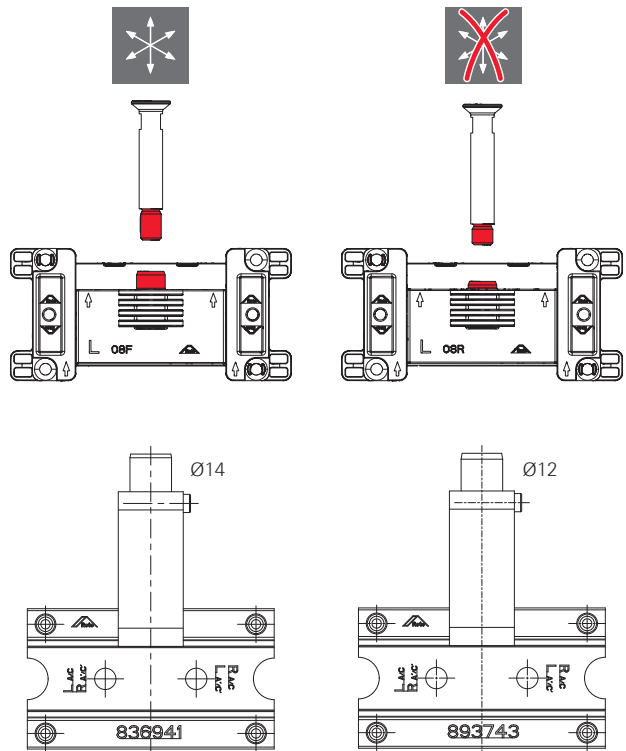
8.4.14 Centre closer



Figures: installation of the non-adjustable version.

Checking the combination of centre closer and mullion locking cam

1. Make sure that the components have been combined correctly:
 - Centre closer, adjustable with mullion locking cam, adjustable and Ø 14.0 drilling jig.
 - Centre closer with mullion locking cam and Ø 12.0 drilling jig.





Positioning the drilling jig



ATTENTION

Improper drilling work may cause property damage.

An incorrect handle position and incorrect alignment of the drilling jig damage the sash during drilling.

- ▶ The handle must be in the open sliding position [1].
- ▶ **Inward running sashes:** position the drilling jig so that the side with the Ø 12.0 / 14.0 drill hole [2] is facing **away** from the handle.
- ▶ **Outward running sashes:** position the drilling jig so that the side with the Ø 12.0 / 14.0 drill hole [2] is facing **to-wards** the handle.

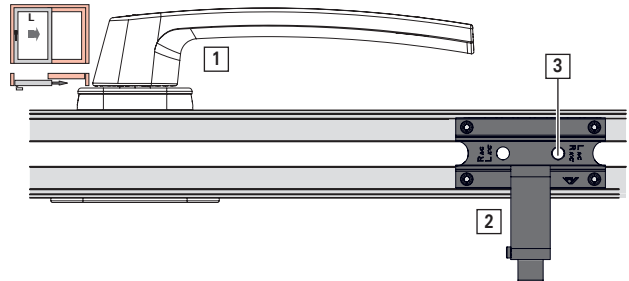
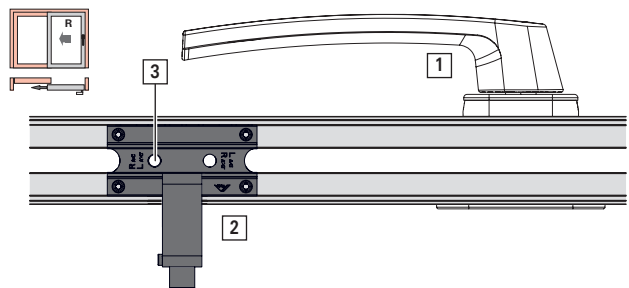
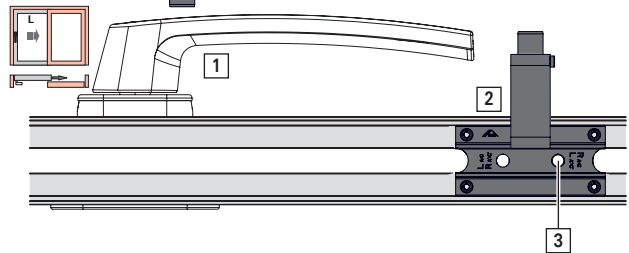
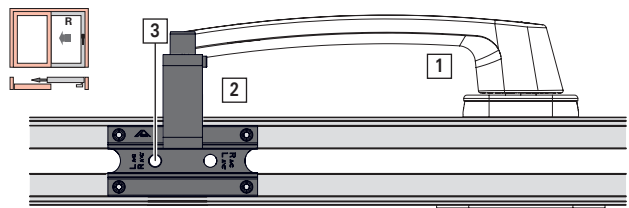
Attach the drilling jig to the control cam [3].

Refer to the installation drawing for the position → *from page 133*.



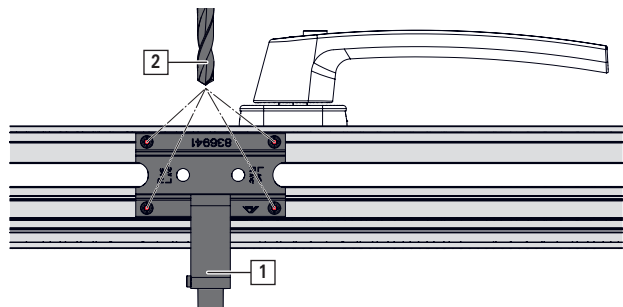
INFO

Drill the holes for the centre closers for anti-pushback function immediately for RC 2 and diagram C → *from page 103*.

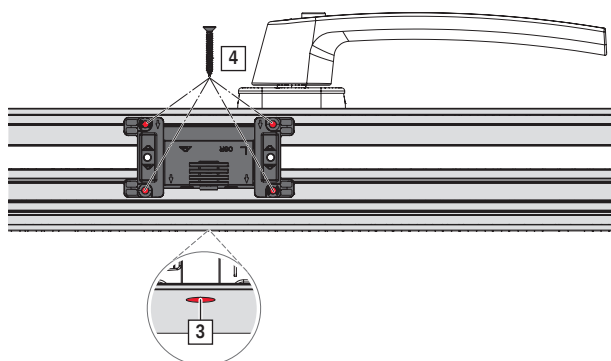


Installing the centre closer

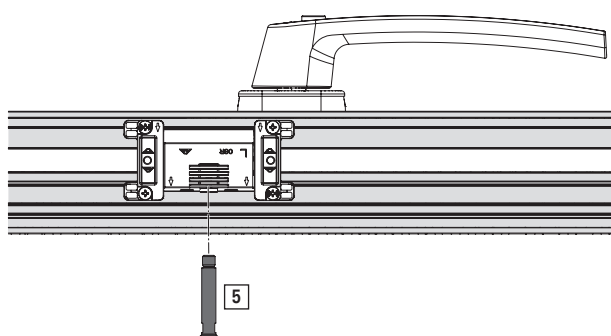
1. Drill holes.
Drill [1]: Ø 12.0 / 14.0
Drill [2]: Ø 3.5
Shown: diagram A, L version



2. Insert the centre closer so that the mullion locking cam mount is facing the drill hole [3] on the outer side of the sash.
Fasten with four screws [4].



3. Insert the mullion locking cam [5] into the cam guide.

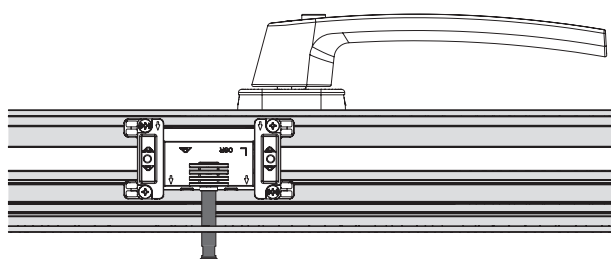


4. Screw down the mullion locking cam.
Tool: size 8 open-end spanner / size 4 hex key



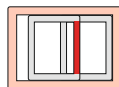
INFO

Tighten the mullion locking cam so that it is hand-tight.





8.4.15 Centre closer for anti-pushback function



INFO

Diagram A / C: install right components for L version; install left components for R version.

Diagram A' / C': install left components for L version; install right components for R version.

Drilling with a Ø 14.0 drilling jig is mandatory for the centre closer, adjustable.

Figures: installation of the non-adjustable version.

Positioning the drilling jig

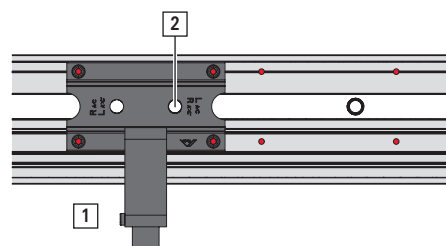
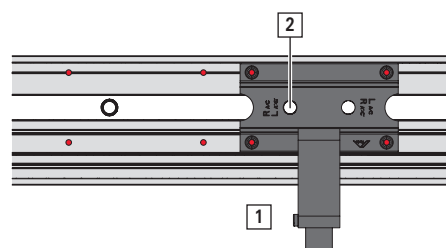
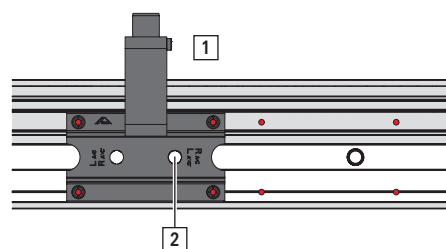
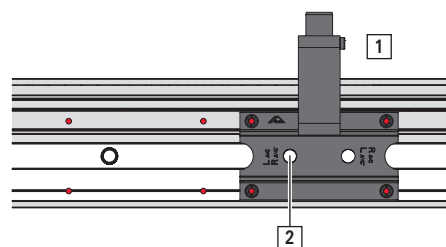


ATTENTION

Improper drilling work may cause property damage.

An incorrect handle position and incorrect alignment of the drilling jig damage the sash during drilling.

- ▶ The handle must be in the open sliding position.
- ▶ **Inward running sashes:** position the drilling jig so that the side with the Ø 12.0 / 14.0 drill hole [1] is facing **away** from the handle.
- ▶ **Outward running sashes:** position the drilling jig so that the side with the Ø 12.0 / 14.0 drill hole [1] is facing **to-wards** the handle.



Attach the drilling jig to the control cam [2].

Refer to the RC installation drawing or diagram C for the position → *from page 133*.



Installation

Sash

Centre closer for anti-pushback function

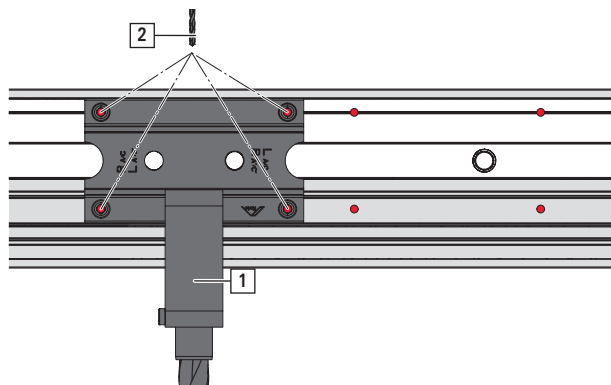
Installing the centre closer for anti-pushback function

1. Drill holes.

Drill [1]: Ø 12.0 / 14.0

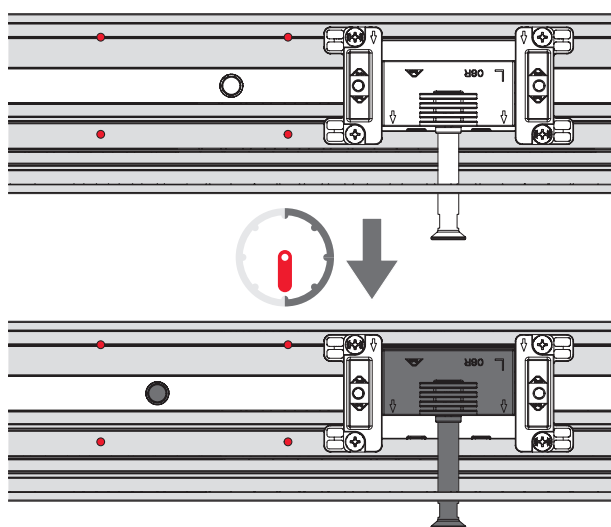
Drill [2]: Ø 3.5

Shown: diagram A, L version



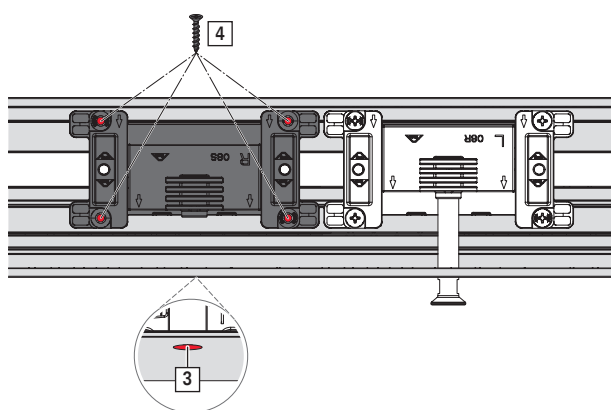
2. Install the centre closer → *from page 100*.

Move the handle to the closed position.

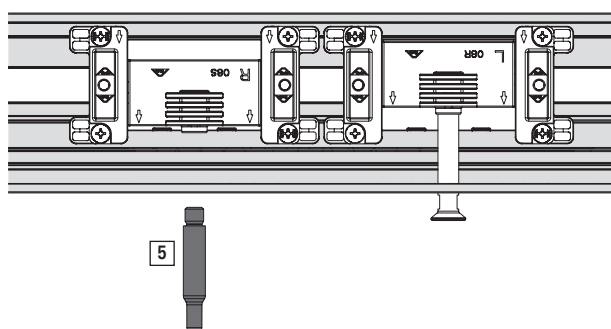


3. Insert the centre closer so that the mullion locking cam mount is facing the drill hole [3] on the outer side of the sash.

Fasten with four screws [4].



4. Insert the pin for anti-pushback function [5] into the cam guide.



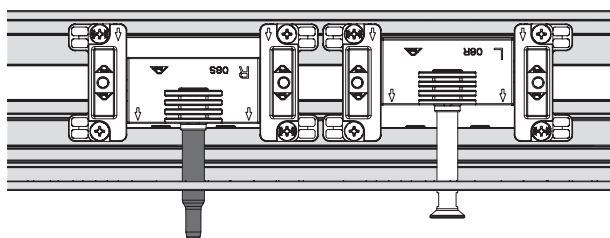


5. Fasten the pin for anti-pushback function.

Tool: size 3 hex key

**INFO**

Tighten the pin for anti-pushback function so that it is hand-tight.

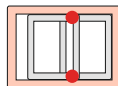


8.4.16 Rubber buffer

Alternatively: install the rubber buffer in the frame .

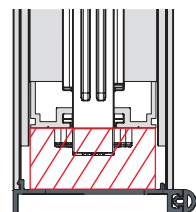
Installing the rubber buffer

1. Install the profile-related cover on the mullion side.
Ensure that the operator track and roller track are running smoothly.



INFO

Place pressure-proof packers underneath the cover at the top and bottom in the hatched area for installing the rubber buffer. Ensure that the cam on the corner drive is running smoothly.

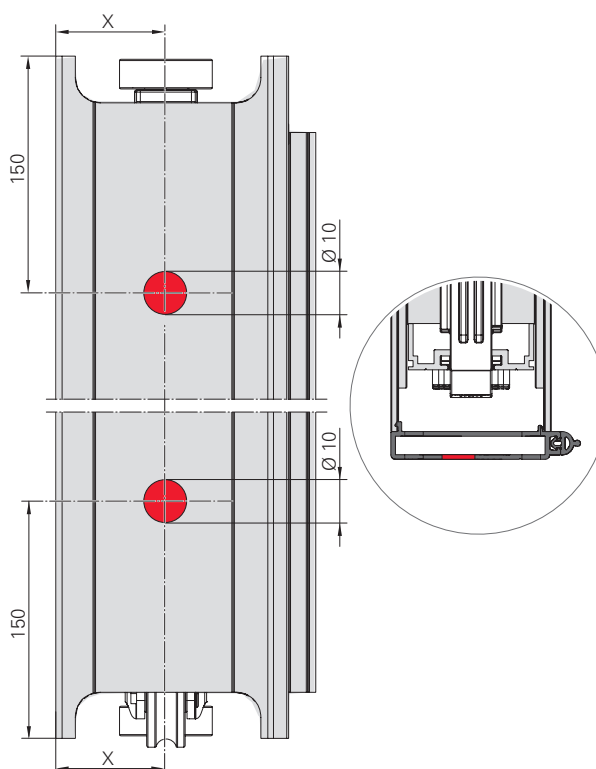


2. Drill two Ø 10 mm holes for rubber buffers at the top and bottom of the cover.

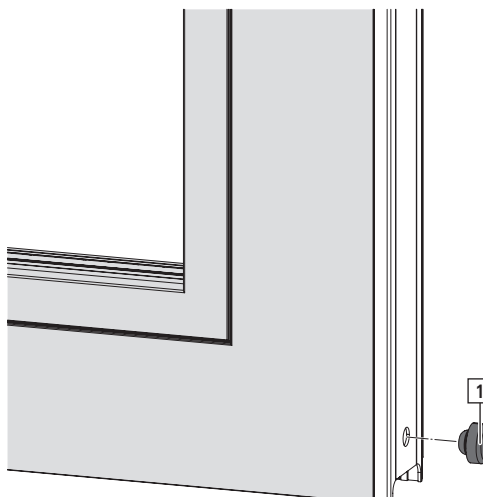


INFO

The dimension X for the drill hole position is profile-related.



3. Insert the rubber buffer [1].





8.5 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. → 14 “Transport” from page 153
 - ▶ 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. → 14 “Transport” from page 153
 - ▶ Do not rest sashes on the rollers.
-

8.5.1 Inserting the sash

**WARNING****An unsecured sash may pose a risk of death!**

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.
Adhere to a screw spacing of max. 300 mm.

Version with split operator track, inserting the sash at the bottom

The operator track is installed in the access area.

The operator track for the fixed glazing area is prepared.

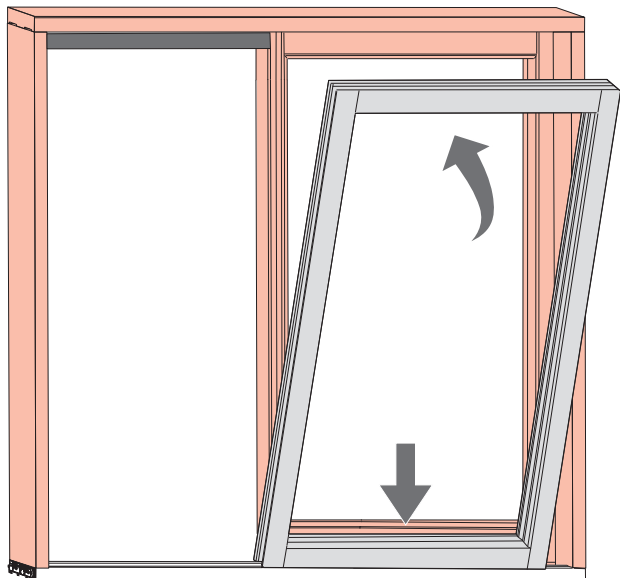
1. Move the handle to the sliding position.



2. In front of the fixed glazing area, guide the sash into the bottom of the frame and position the roller unit on the roller track without impact.

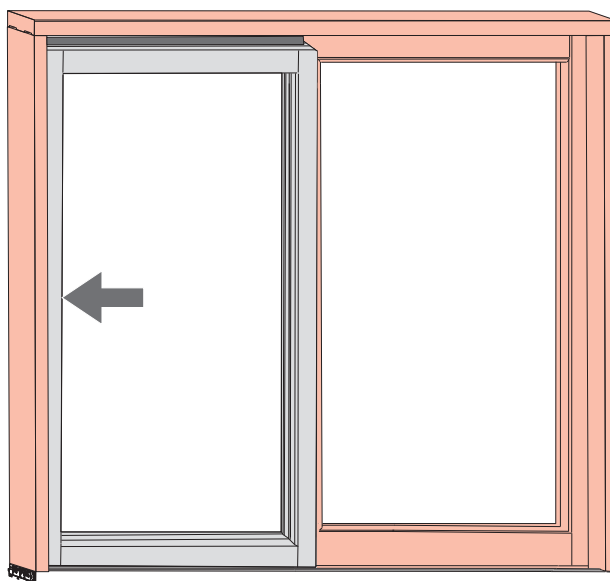
For roller tracks with just one wall, ensure that the roller unit rollers are not set down next to the roller track.

Check that the roller unit rollers are correctly positioned on the roller track by pushing the sash.





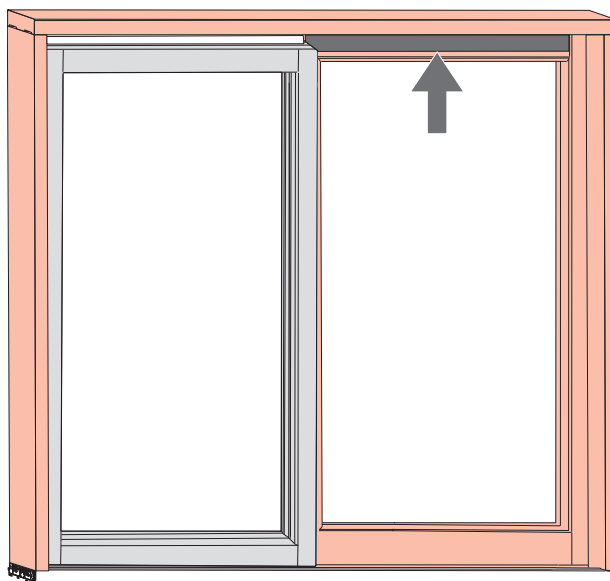
3. Push the sash onto the roller track in front of the access area in a controlled manner until all control units are located in the operator track that is already installed.



4. Move the handle to the closed position.

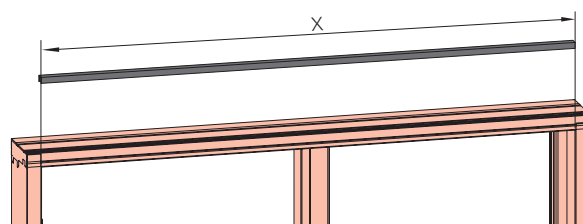


5. Insert the prepared operator track into the frame in the fixed glazing area and fasten with screws (screws spaced max. 300 mm apart).



Version with continuous operator track, inserting the sash at the bottom

1. Cut the operator track to size.



2. Move the handle to the sliding position.



Installation

Joining the sash and frame

Inserting the sash

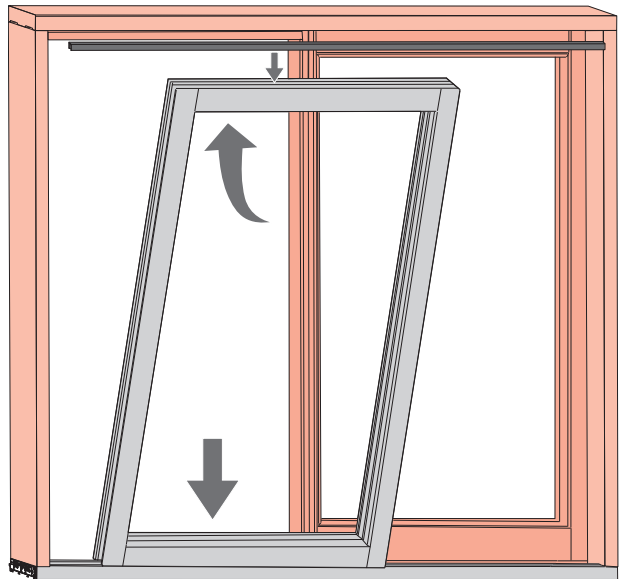
3. In front of the access area, guide the sash into the bottom of the frame and position the roller unit on the roller track without impact.

For roller tracks with just one wall, ensure that the roller unit rollers are not set down next to the roller track.

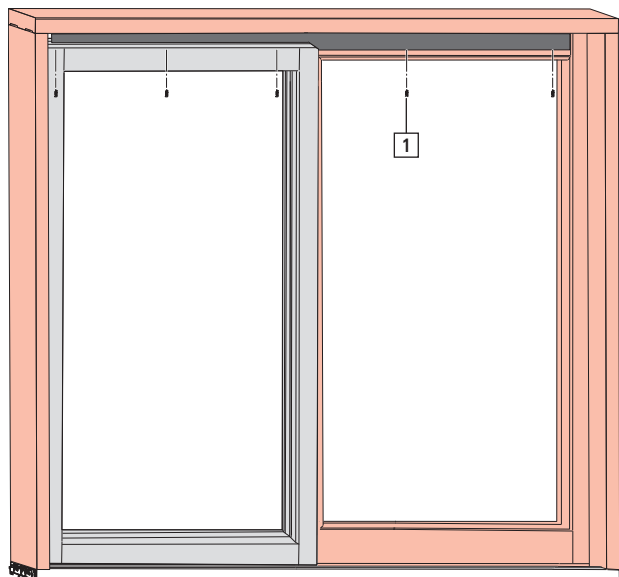
Check that the roller unit rollers are correctly positioned on the roller track by pushing the sash.

Position the operator track on the control units at the top.

Tilt the sash with operator track fitted inwards in a controlled manner at the top until the operator track can be installed in the frame groove provided.



4. Fasten the operator track with screws [1] (screws spaced max. 300 mm apart).

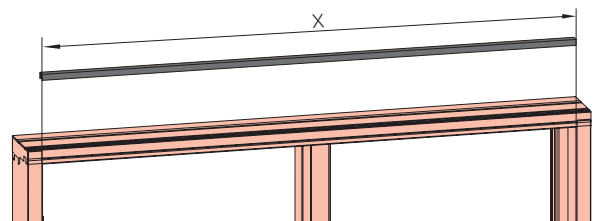


Version with continuous operator track, inserting the sash at the top

1. Move the handle to the sliding position.



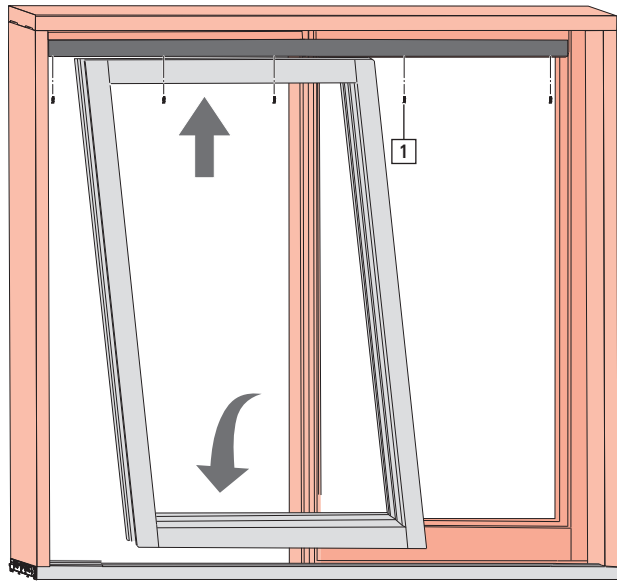
2. Cut the operator track to size.





3. Fasten the operator track with screws [1] (screws spaced max. 300 mm apart).

In front of the access area, guide the sash into the top of the frame until the control units engage in the operator track.



4. Tilt the sash inwards in a controlled manner at the bottom until the roller units are positioned vertically on the roller track.

For roller tracks with just one wall, ensure that the roller unit rollers are not set down next to the roller track.

Check that the roller unit rollers are correctly positioned on the roller track by pushing the sash.

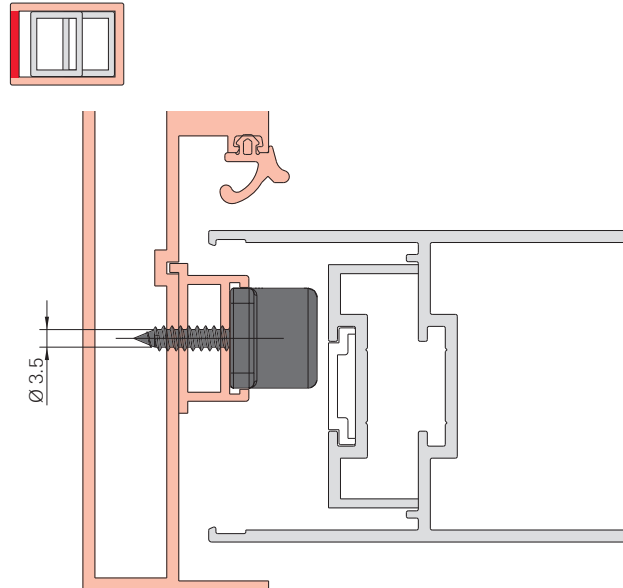
8.6 Frame

8.6.1 Strikers

1. For the position of the strikers, see the installation drawing → *from page 133*. Alternatively: with marking jig.

Drill holes.

Drill: 2 x Ø 3.5

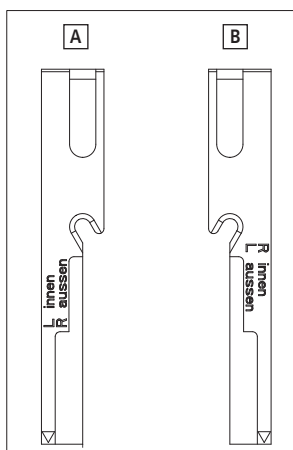
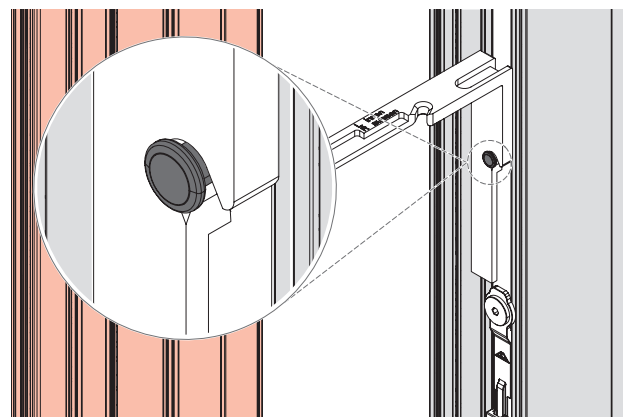


2. Fasten the striker with two screws.

Positioning with marking jig

⇒ Join the sash and frame.

1. Move the handle to the open sliding position.
2. Fit the marking jig on the locking cam, aligned depending on the design variant.



[A] For inward running L version and outward running R version

[B] For inward running R version and outward running L version



3. Push the sash shut until the jig [1] is resting on the frame.

Transfer the edge [2] marked with the arrow to the frame.

Position the striker [3] with its top edge at the marking.

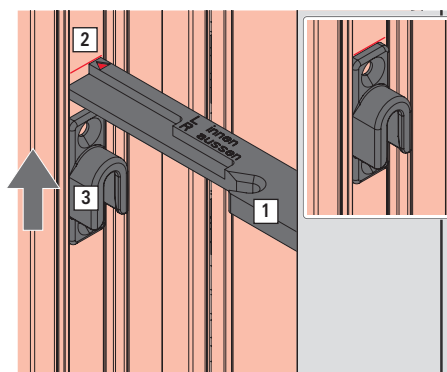
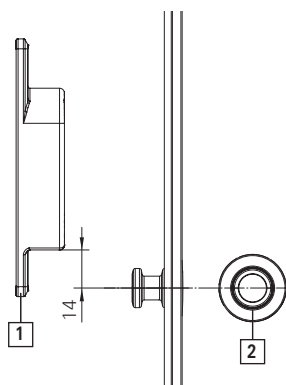


Figure: inward running R version

8.6.2 Striker to prevent incorrect operation

8.6.2.1 Drilling the holes for the striker to prevent incorrect operation

Dimensional drawing in open sliding position



[1] Striker to prevent incorrect operation

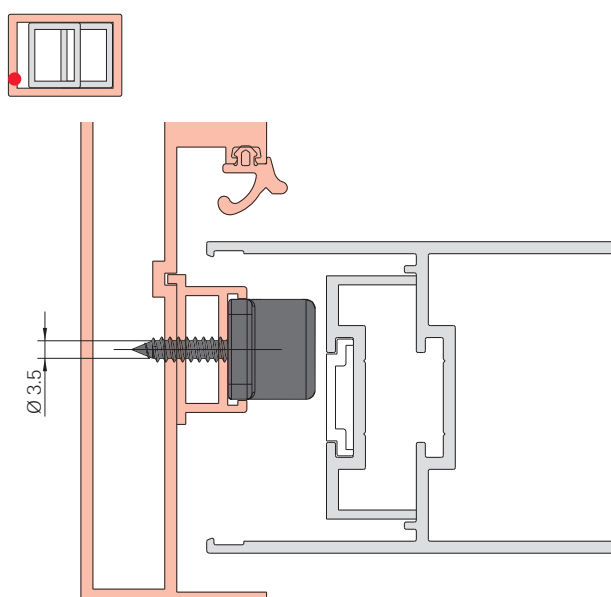
[2] Locking cam

Alternatively: use a marking jig → *from page 112.*

1. For the position of the striker to prevent incorrect operation, see the installation drawing.

Drill holes.

Drill: 2 x Ø 3.5



8.6.2.2 Installing the striker to prevent incorrect operation

1. Fasten the striker to prevent incorrect operation [1] with two screws [2].

**INFO**

Note the drilling specifications →
8.6.2.1 "Drilling the holes for the striker to prevent incorrect operation" from page 113.

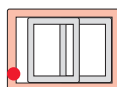
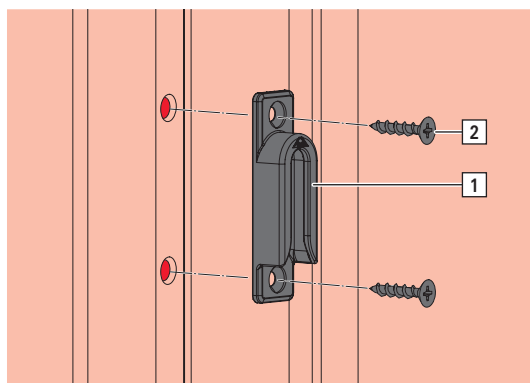


Fig. 8.4: Symmetrical striker to prevent incorrect operation

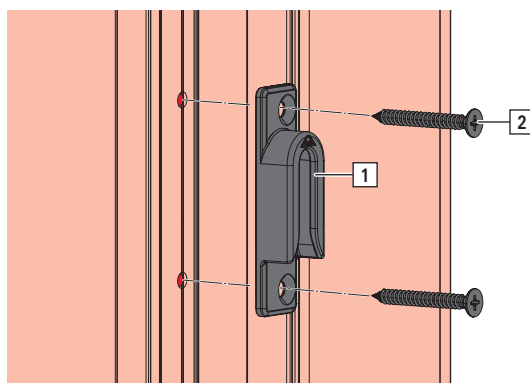


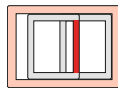
Fig. 8.5: Asymmetrical striker to prevent incorrect operation



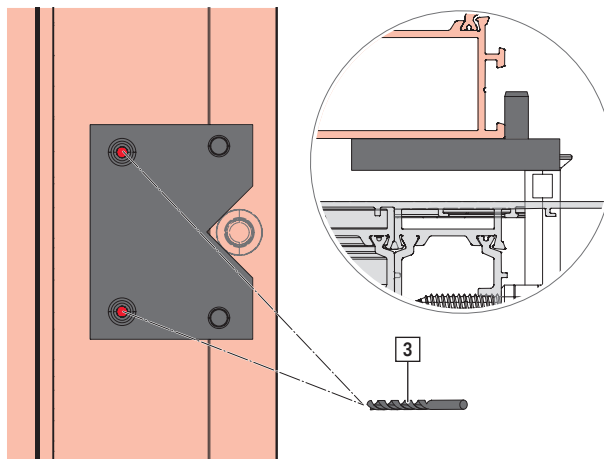
8.6.3 MUL striker

8.6.3.1 Drilling the holes for the MUL striker

1. Place the drilling jig for MUL striker [1] flush against the frame profile at the height of the locking cam [2]. Mark the position of the drilling jig.



2. Drill the holes [3].
 Drill: Ø 3.5



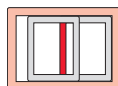
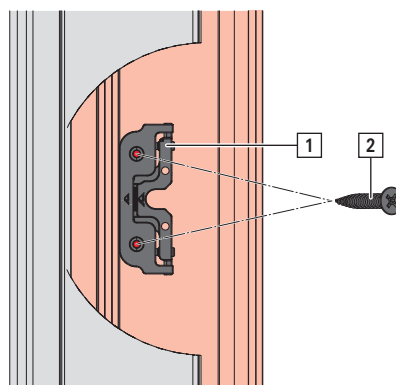
8.6.3.2 Installing the mullion striker

1. Fasten the mullion striker [1] with two screws [2].

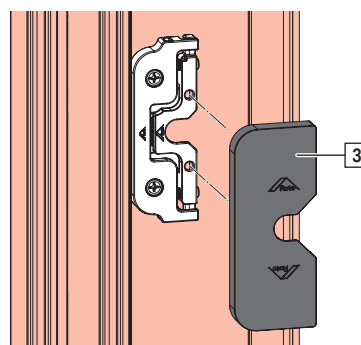


INFO

Note the drilling specifications .



2. Clip the cover cap [3] onto the mullion striker.



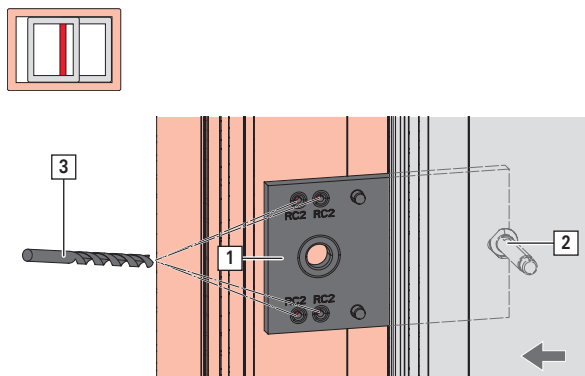
8.6.4 SEC MUL striker

8.6.4.1 Drilling the holes for the mullion security striker

1. Place the drilling jig for the mullion security striker [1] flush against the frame profile at the height of the locking cam [2]. Mark the position of the drilling jig. For better guidance, move the sash with locking cam fitted in the direction of the arrow.

Drill the holes [3].

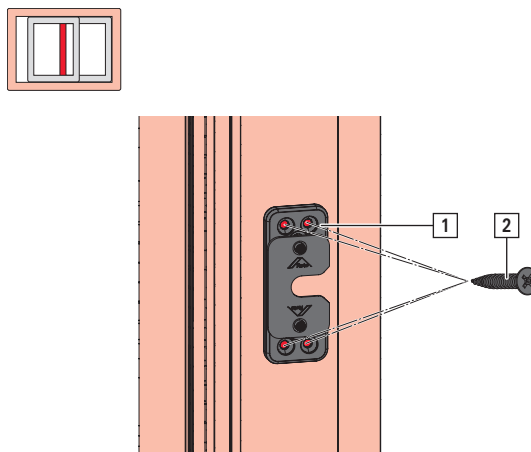
Drill: 4 x Ø 3.5



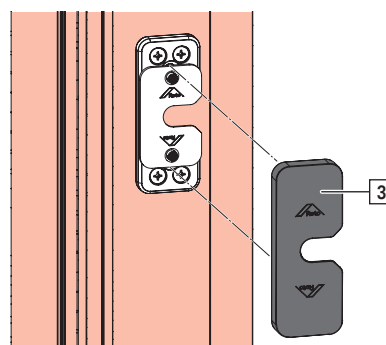
8.6.4.2 Installing the mullion security striker

⇒ Note the drilling specifications .

1. Fasten the mullion security striker [1] with four screws [2].



2. Clip the cover cap [3] onto the mullion security striker.





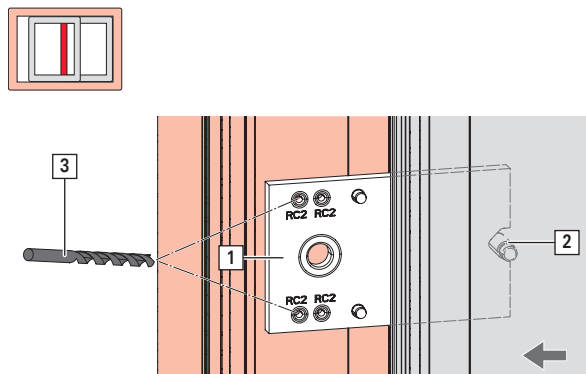
8.6.5 Striker for anti-pushback function

Installing the striker for anti-pushback function

1. Place the drilling jig for the striker for anti-pushback function [1] flush against the frame profile at the height of the pin [2]. For better guidance, move the sash with pin fitted in the direction of the arrow.

Drill the holes [3].

Drill: Ø 3.5 mm



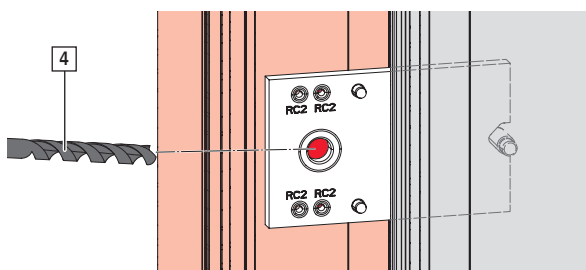
2. Drill the hole [4].

Drill: Ø 12.5 mm

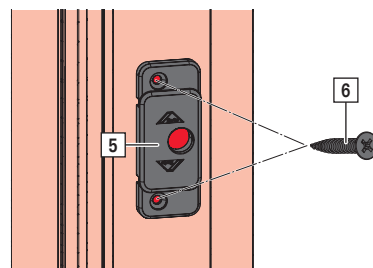


INFO

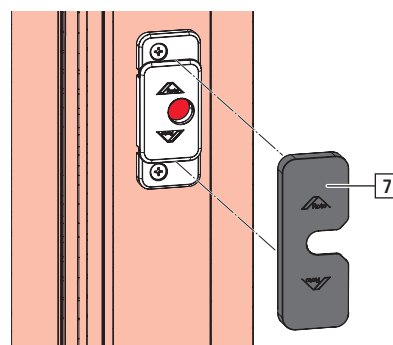
Refer to the system-specific profile assessment for the drilling depth.



3. Fasten the striker for anti-pushback function [5] with two screws [6].



4. Clip the cover cap [7] onto the striker for anti-pushback function.



8.6.6 Activator and packer

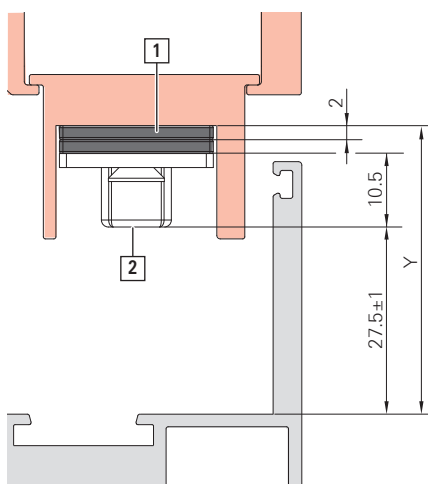
- ⇒ The control unit with Soft function comes assembled in its delivery state (= untensioned).
- ⇒ The element is glazed.
- ⇒ Pressure-proof packers have been placed underneath the frame profile in the area of the activator.

8.6.6.1 Preparing the positioning jig

- ⇒ The control unit with Soft function comes assembled in its delivery state (= untensioned).
- ⇒ The element is glazed.
- ⇒ Pressure-proof packers have been placed underneath the frame profile in the area of the activator.

Determining the quantity of packers

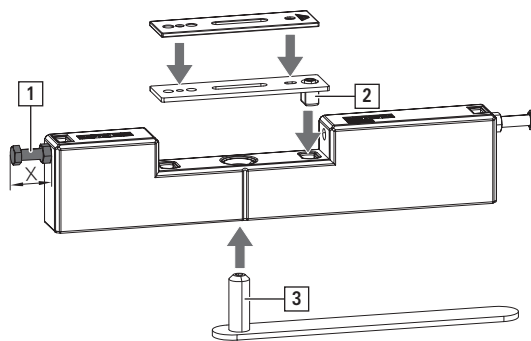
1. Calculate or refer to the profile assessment for the quantity of packers required [1].
 Quantity of packers = $(Y - 38) / 2$
 Maintain a distance of 27.5 ± 1 mm between the highest point of the activator [2] and the control unit supporting surface.



Adjusting and equipping the positioning jig for the activator with a centre screw fixing

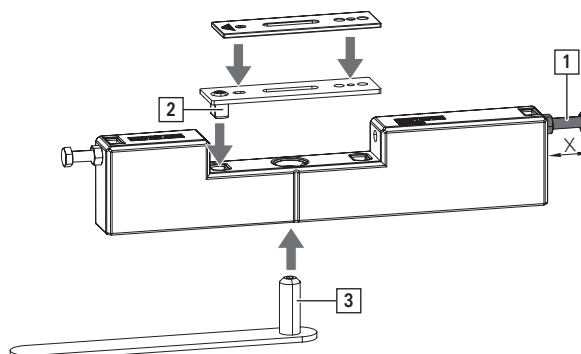
On the locking side for control unit with SoftClose

1. Adjust the screw [1] on the "SoftClose" side (X = profile-related).
2. If necessary, connect the packer to the activator using locating aids. Ensure that the slots are aligned.
3. Place everything in the positioning jig mount. The activator bolt [2] is facing towards the "SoftOpen" text.
4. Insert the drilling aid [3] into the positioning jig.



On the mullion side for control unit with SoftOpen

1. Adjust the screw [1] on the "SoftOpen" side (X = profile-related).
2. If necessary, connect the packer to the activator using locating aids. Ensure that the slots are aligned.
3. Place everything in the positioning jig mount. The activator bolt [2] is facing towards the "SoftClose" text.
4. Insert the drilling aid [3] into the positioning jig.





Control unit with SoftStop

Prepare SoftClose or SoftOpen accordingly, depending on the installation situation.

8.6.6.2 Diagram A



INFO

Pay attention to the profile assessment.

Installation without a positioning jig

Installing the activator with / without packer(s) on the locking side

1. Predrill a hole for the screw [1] (for dimensions X and Y, see the profile assessment).

If necessary, connect the packer to the activator using locating aids. Ensure that the slots are aligned.

Slightly tighten the activator with one screw to position it so that the activator can still be moved. The activator bolt [2] is facing towards the centre of the access area.

Close the sash slowly and open it again to move the activator into the installation position.

Predrill the holes for screws [3].

Fasten the activator with three screws.

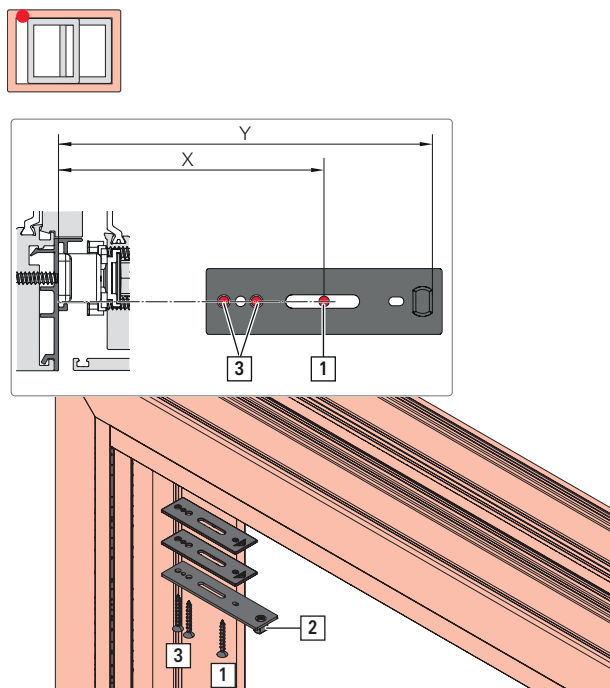


Fig. 8.6: Activator and packers with a centre screw fixing

Installing the activator with / without packer(s) on the mullion side

1. Predrill a hole for the screw [1] (for dimension Z, see the profile assessment).

Slightly tighten the activator with one screw to position it (for dimension Y, see the profile assessment) so that the activator can still be moved. The activator bolt is facing towards the centre of the access area.

Slowly open the sash fully and close it again to move the activator into the installation position.

Predrill the holes for screws [2].

Fasten the activator with three screws.

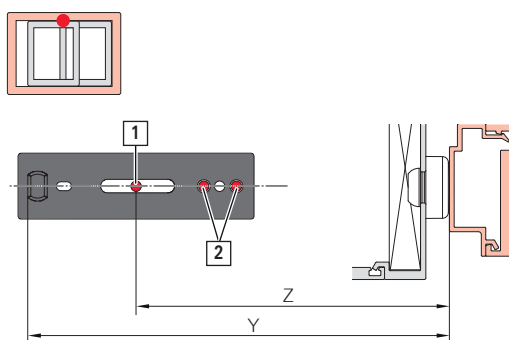


Fig. 8.7: Activator and packers with a centre screw fixing



INFO

Control unit with SoftOpen: if the sash should not hit the buffer, move the activator screw position by at least 21 mm ($Z + 21$ and $Y + 21$).



Installation with a positioning jig

Installing the activator with / without packer(s) using a positioning jig on the locking side

1. Insert the equipped positioning jig into the operator track and push the screw head of the adjusting screw onto the frame on the locking side until it reaches the stop.
 Predrill through the drilling aid with a Ø 3.5 drill [A].
 Remove the drilling aid.
 Slightly tighten the activator with one screw [5] through the positioning jig to position it so that the activator can still be moved.
 Remove the positioning jig.
 Close the sash slowly and open it again to move the activator into the installation position.
 Predrill the holes for screws [6] in the same screw axis as the first screw.
 Fasten the activator with three screws.

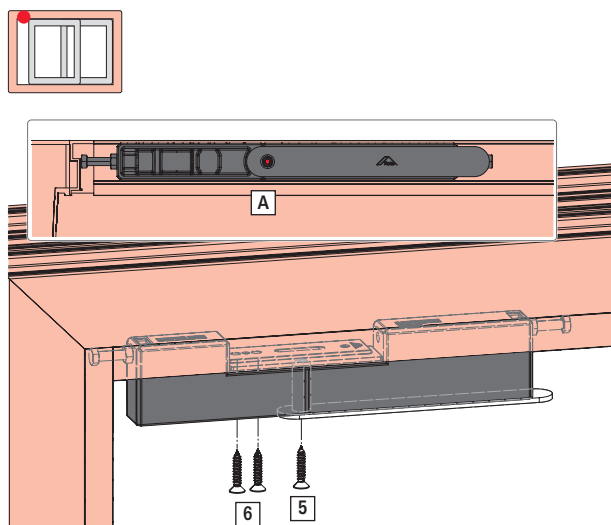


Fig. 8.8: Activator and packers with a centre screw fixing

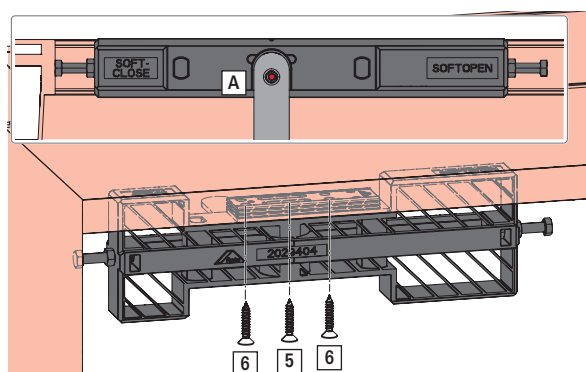


Fig. 8.9: Activator and packers with an asymmetrical screw fixing

Installing the activator with / without packer(s) using a positioning jig on the mullion side

1. Insert the equipped positioning jig into the operator track. Push the screw head of the adjusting screw onto the frame on the mullion side until it reaches the stop.
 Predrill through the drilling aid with a Ø 3.5 drill [A].
 Remove the drilling aid.
 Slightly tighten the activator with one screw [5] through the positioning jig to position it so that the activator can still be moved.
 Remove the positioning jig.
 Close the sash slowly and open it again to move the activator into the installation position.
 Predrill the holes for screws [6] in the same screw axis as the first screw.
 Fasten the activator with three screws.

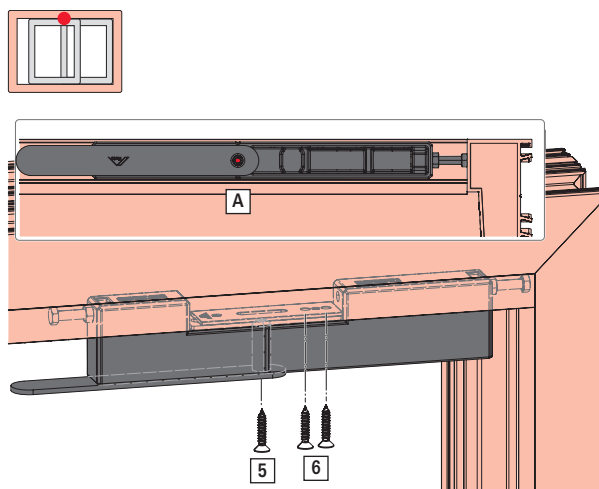
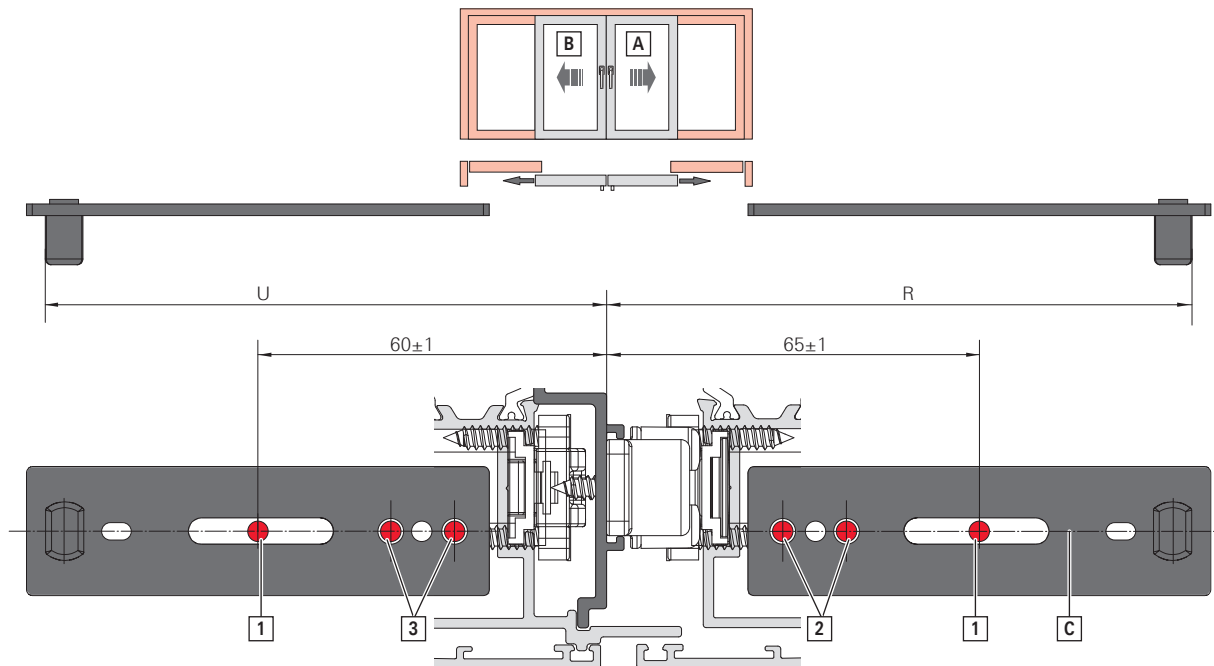


Fig. 8.10: Activator and packers with a centre screw fixing

8.6.6.3 Diagram C



- [A] First opening sash
- [B] Second opening sash
- [C] Centre of guide groove in the operator track

1. Connect the packers to the activator using locating aids. Ensure that the slots are aligned.
 Predrill a hole for the screw [1] (for the first opening sash to dimension S, for the second opening sash to dimension V, see profile assessment). Slightly tighten every activator with one screw each to position them (for dimensions R and U, see the profile assessment) so that the activator can still be moved.
 Close the second opening sash [B] slowly and open it again to move the activator into the installation position.
 Predrill the holes for screws [2].
 Fasten with three screws.
 Close the second opening sash and move the handle to the closed position.
 Close the first opening sash [A] slowly and open it again to move the activator into the installation position.
 Predrill the holes for screws [3].
 Fasten with three screws.



8.6.7 Tensioning the control unit with soft function



CAUTION

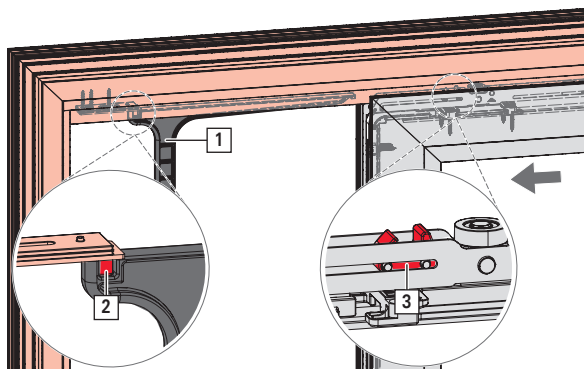
Risk of injury caused by tensioning the control unit with soft function by hand.

When installing the control unit with soft function, tensioning by hand may cause injuries due to sharp edges.

1. Only tension the control unit with soft function using a tensioning tool.

1. Mount the tensioning tool recess [1] in the activator bolt [2].

Push the element shut slowly until the connector [3] on the tensioning tool engages in the control unit with soft function.



2. Open up the element slowly to activate the soft function. The connector on the tensioning tool will be released automatically.

8.6.8 Tilt protection device



DANGER

The uncontrolled tilting of sashes with aspect ratios > 2:1 poses a risk of death!

Uncontrolled tilting may cause sashes with aspect ratios > 2:1 to jump out of the operator track. This may lead to hazardous situations and cause serious or fatal accidents.

- ▶ The roller track must have two walls → 3.6 "Dimensions of the roller track" from page 27.
- ▶ Install the tilt protection device (only without control unit with Soft function) → 3.7 "Dimensions of the tilt protection device" from page 27.
- ▶ An installation space examination is a mandatory part of a profile assessment.



ATTENTION

Premature installation may cause property damage.

If the tilt protection device is installed before the sash and frame are joined, this can damage the installed hardware.

1. Only install the device once the sash and frame have been joined.

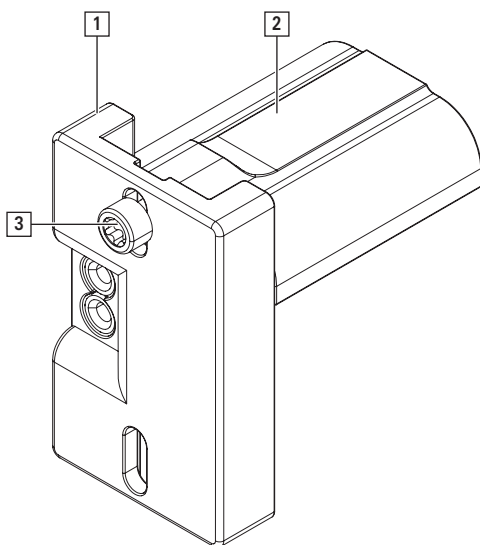


INFO

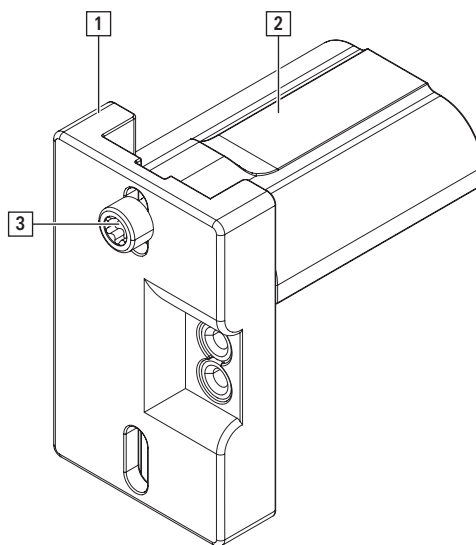
Example diagram. Drilling patterns are profile-related (available upon request).

Preparing the drilling jig

For use on the locking side



For use on the mullion side



1. Detach the drilling plate [1] from the stop [2] by loosening the screw [3].
2. Turn the drilling plate 180°.
3. Fasten the drilling plate to the stop with one screw.



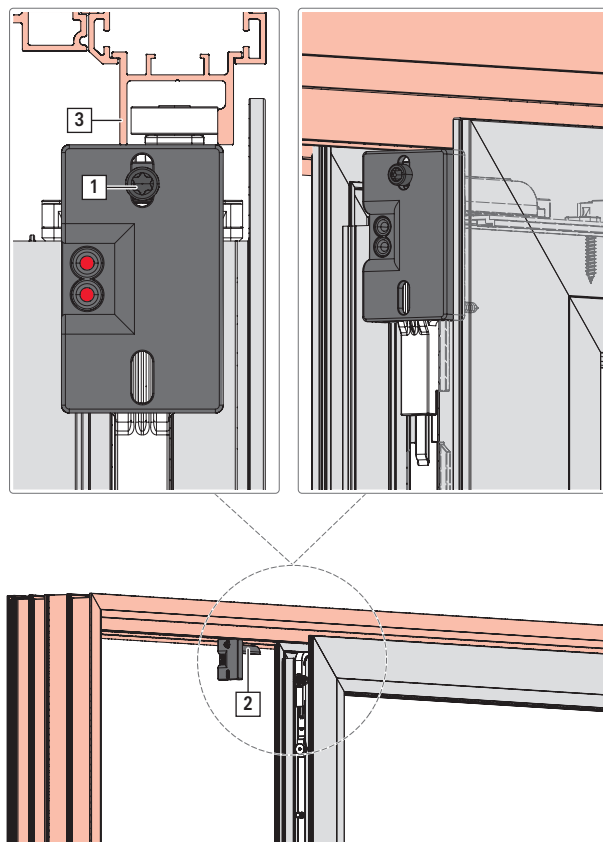
Drilling the holes for the tilt protection device

1. Open the sash.
Loosen the screw [1] on the drilling plate [2].
Position the drilling jig on the corner of the sash at the top on the locking side.
 - **Inward running sashes:** position the drilling jig so that the side with the drill holes is facing **away** from the handle.
 - **Outward running sashes:** position the drilling jig so that the side with the drill holes is facing **to-wards** the handle.Push the drilling plate up until it reaches the stop on the operator track [3].
Fasten the drilling plate with a screw again.
Align the drilling jig so that it is centred relative to the hardware and drill through two walls.
Drill: 2 x Ø 3.5



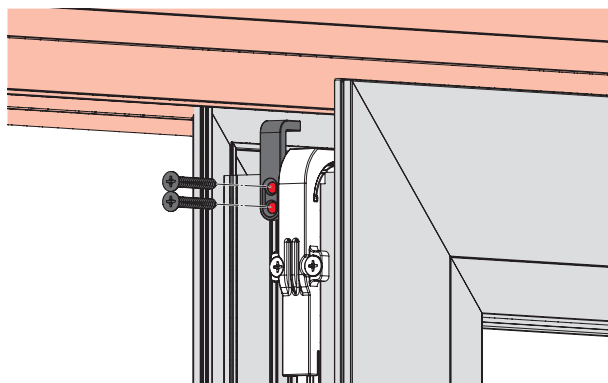
INFO

Screw lengths are profile-related.



Installing the tilt protection device

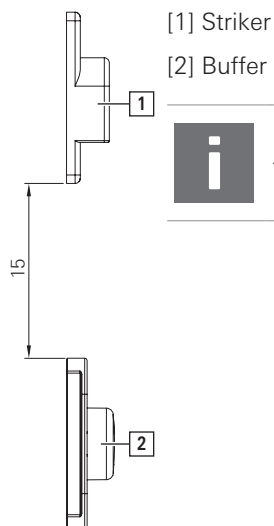
- ⇒ The adapter profile (if present) is routed .
- ⇒ The adapter profile stops flush with the sash rebate.
1. Fasten the tilt protection device with two screws through two walls.



8.6.9 Buffer

8.6.9.1 Drilling the holes for the buffer

Installation drawing in open sliding position



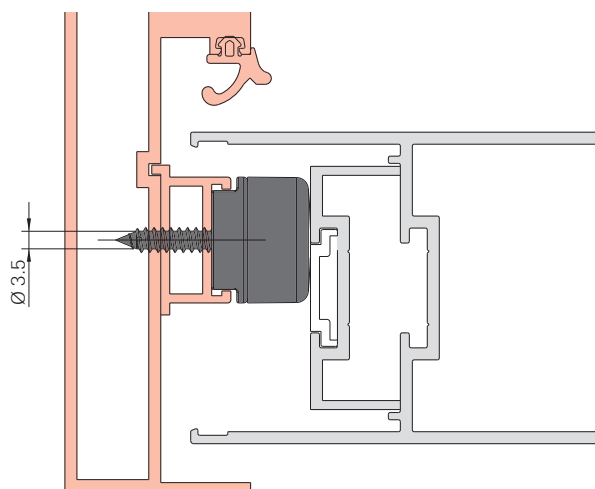
INFO

The version on the bottom is mirror-inverted.

1. For the position of the buffer, see the installation drawing. → *from page 133*

Drill holes.

Drill: 2 x Ø 3.5





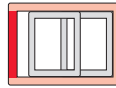
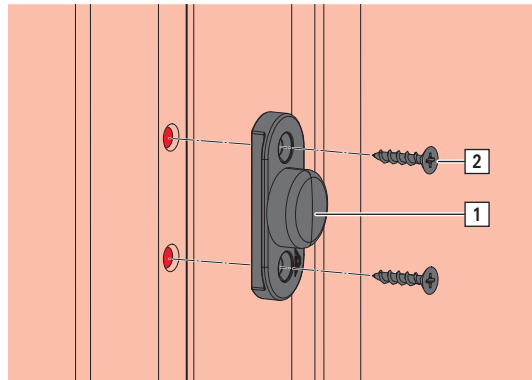
8.6.9.2 Installing the buffer

1. Fasten each buffer [1] with two screws [2].



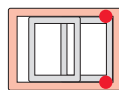
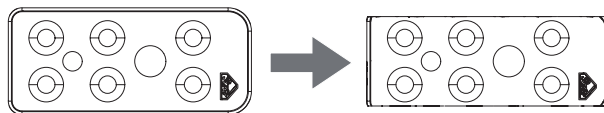
INFO

Note the drilling specifications →
8.6.9.1 "Drilling the holes for the buffer" from page 126.

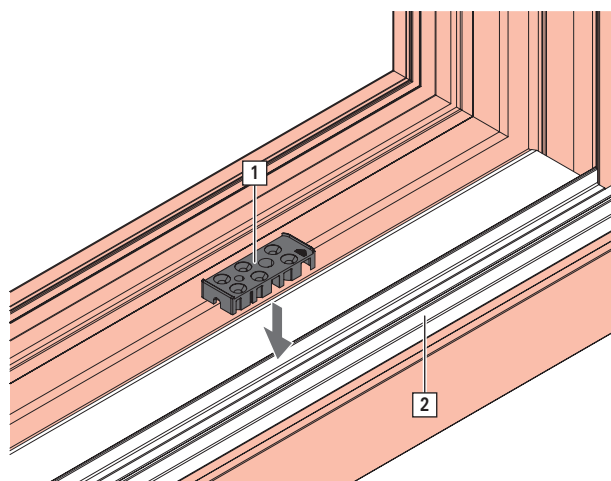


8.6.10 End stop with packer

1. Adapt the end stop packer and, if necessary, the end stop on a profile-related basis.



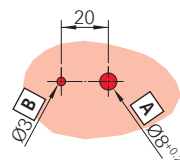
2. Place the end stop packer [1] on the roller track [2] and fasten with screws.



3. Drill the holes for the end stop.

[A]: $\varnothing 8.0+0.2$ (1x)

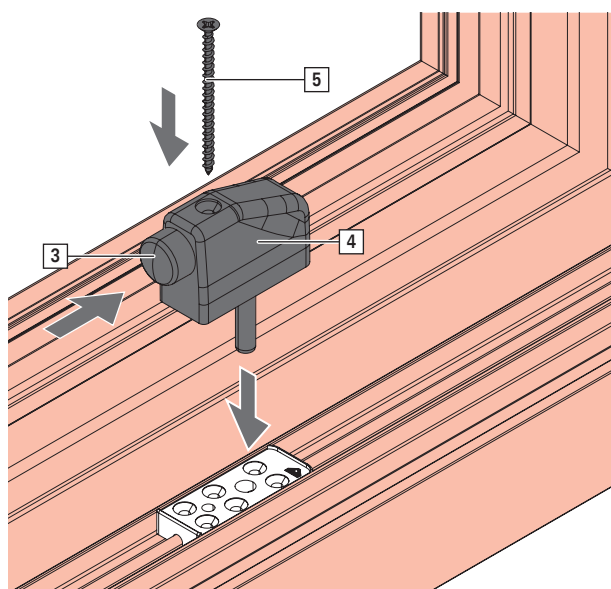
[B]: predrill $\varnothing 3.0$ (1x)



INFO

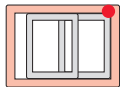
The specifications for drilling in aluminium and steel profiles must be adhered to.

4. Install the rubber buffer [3] in the end stop [4], position it on a packer, and fasten with a screw [5].





8.6.11 Operator track stopper



INFO

Pay attention to the profile assessment.

Installation without a positioning jig

1. If necessary, connect the packer [1] to the stopper [2] using locating aids. Ensure that the slots are aligned.

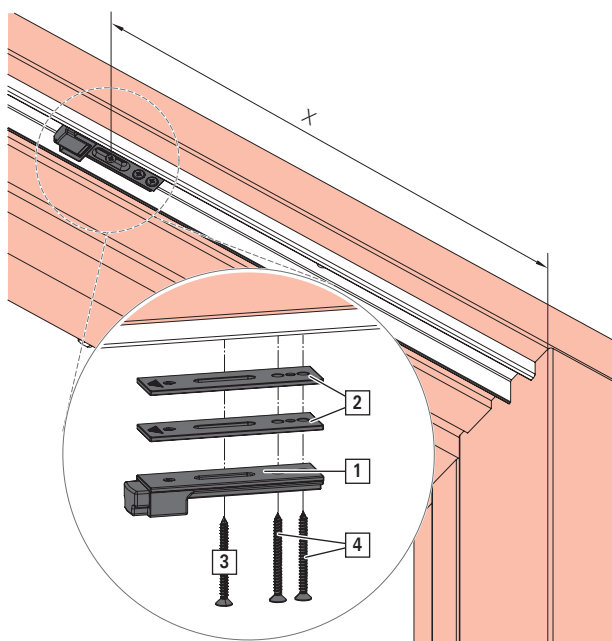
Predrill a hole for the screw [3] (dimension X can be freely selected).

Slightly tighten the stopper with one screw to position it so that the stopper can still be moved. The stopper buffer side is facing towards the centre of the access area.

Open the sash slowly and close it again to move the stopper into the installation position.

Predrill the holes for screws [4].

Fasten the stopper with three screws.



Installation with a positioning jig

Installing the operator track stopper, diagram A

1. Adjust the screw [1] (dimension X can be freely selected).

If necessary, connect the packer [2] to the stopper [3] using locating aids. Ensure that the slots are aligned.

Place everything in the positioning jig mount.

Insert the drilling aid [4] into the positioning jig.

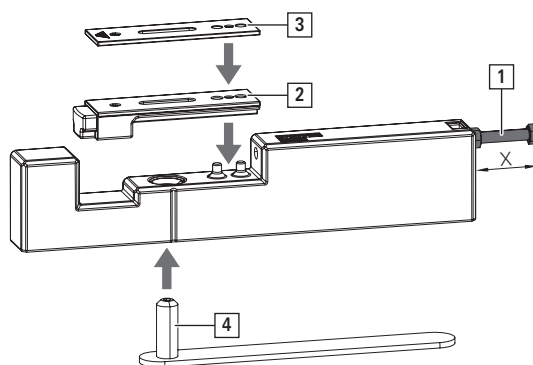


Fig. 8.12: Stopper and packers with a centre screw fixing

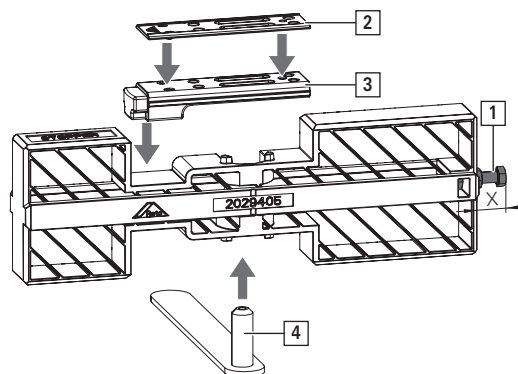


Fig. 8.13: Stopper and packers with an asymmetrical screw fixing



2. Insert the equipped positioning jig into the operator track and push the screw head of the adjusting screw onto the frame until it reaches the stop.
 Predrill through the drilling aid with a Ø 3.5 drill [A].
 Remove the drilling aid.
 Slightly tighten the stopper with one screw [5] through the positioning jig to position it so that the stopper can still be moved.
 Open the sash slowly and close it again to move the stopper into the installation position.
 Predrill the holes for screws [6].
 Fasten the stopper with three screws.

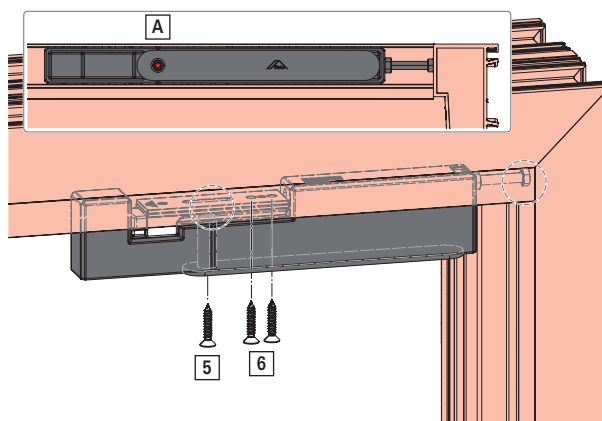


Fig. 8.14: Stopper and packers with a centre screw fixing

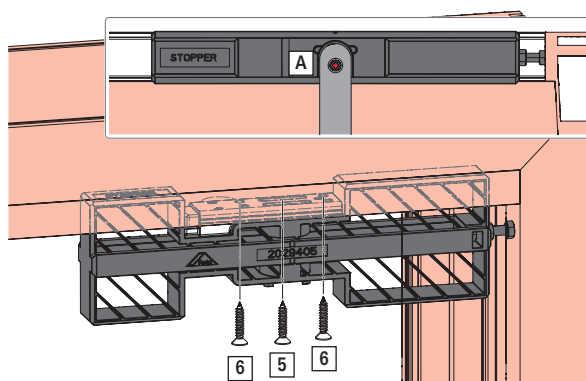
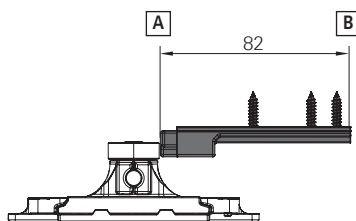


Fig. 8.15: Stopper and packers with an asymmetrical screw fixing

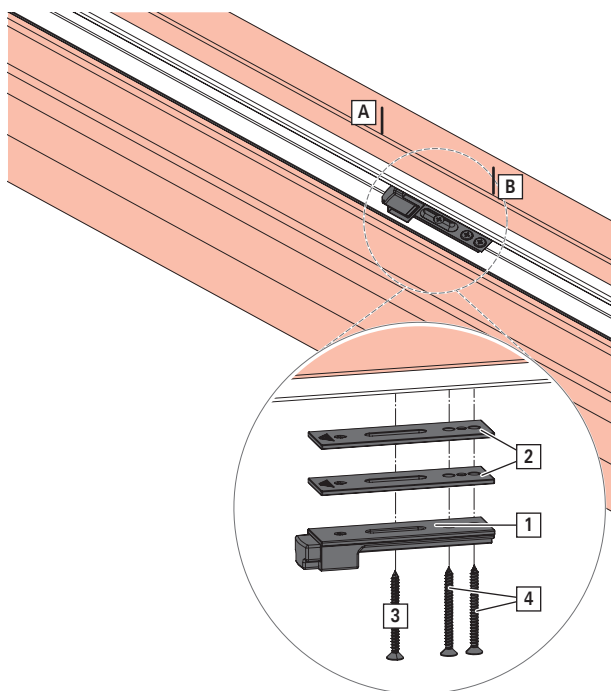
Installing the operator track stopper, diagram C

⇒ The second opening sash is on the bench: mark the position of the roller outer edge of the control unit on the espagnolette side [A].

1. Close the second opening sash.
 Transfer the marking for the "position of the roller outer edge of the control unit" from the sash to the frame and move it 82 mm towards the espagnolette side [B].



2. Insert the stopper [1] and, if required, packers [2] into the operator track.
Move the stopper up to the marking [B].
Fasten loosely with one screw [3] but so that it is not yet secure.
Check the stopper position and reposition if necessary.
Fasten the stopper with three screws.



8.6.12 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.



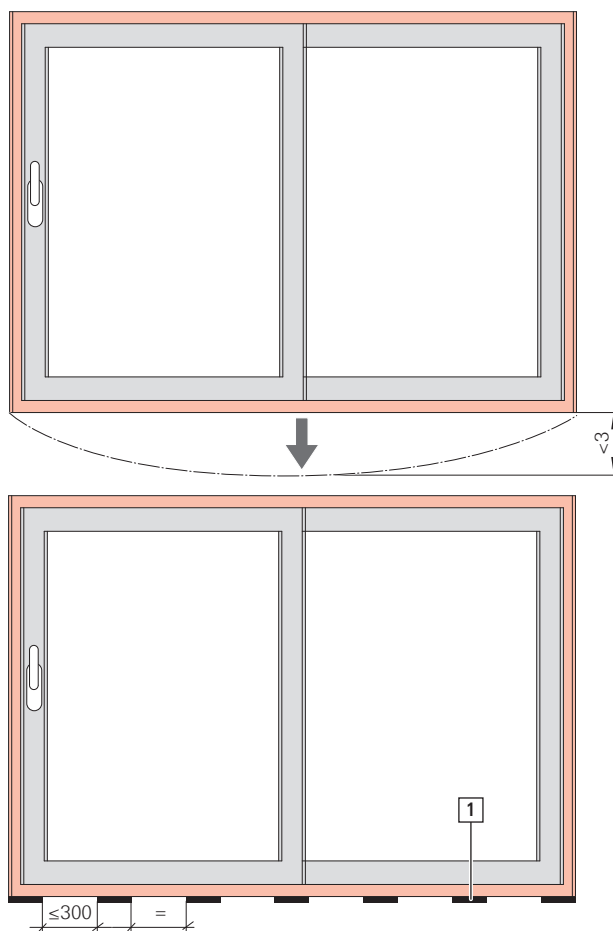
INFO

In order to ensure that the element works properly and is safe, the bending of the frame must not exceed 3 mm.



INFO

Place supports uniformly under the threshold across its entire area (spaced max. 300 mm apart, profile-related).



[1] Packer



9 Installation drawings

9.1 Explanation

The following markings are used in the installation drawings to emphasise references and other elements:

Marking	Meaning
abschlb.	Lockable
abschließbar	Lockable
aktiv	First opening sash
Artikel Nr.	Material number
aussenlaufend	Running outward
Beschlag	Hardware
Flügelaußenbreite	Sash external width
Flügelaußenhöhe	Sash external height
Flügelbreite	Sash width
Flügelhöhe	Sash height
FB	Sash width
FB(A)	Sash width of first opening sash
FB(P)	Sash width of second opening sash
FH	Sash height
Garnitur-Positionierung	Set positioning
geschlossen	Closed
Getriebe	Espagnolette
GH	Handle height
Griffhöhe	Handle height
Gtr.	Espagnolette
innenlaufend	Running inward
Links	Left
Masse ... sind profilabhängig	Dimensions ... are profile related
Mitte Fräsung	Centre of routing
mittig	Centred
n. abschließbar	Not lockable
offen	Open
optional	Optional
passiv	Second opening sash
Rechts	Right
Schema A	Diagram A
Schema C	Diagram C
Schließstücksitze	Striker positions
Schliesszapfenposition	Locking cam position
Standard	Standard
T	Connecting rod
Treibstange	Connecting rod
Treibstangenmaße	Connecting rod dimensions



INFO

All connecting rod dimensions CR ± 0.5 mm.

9.2 Diagram A

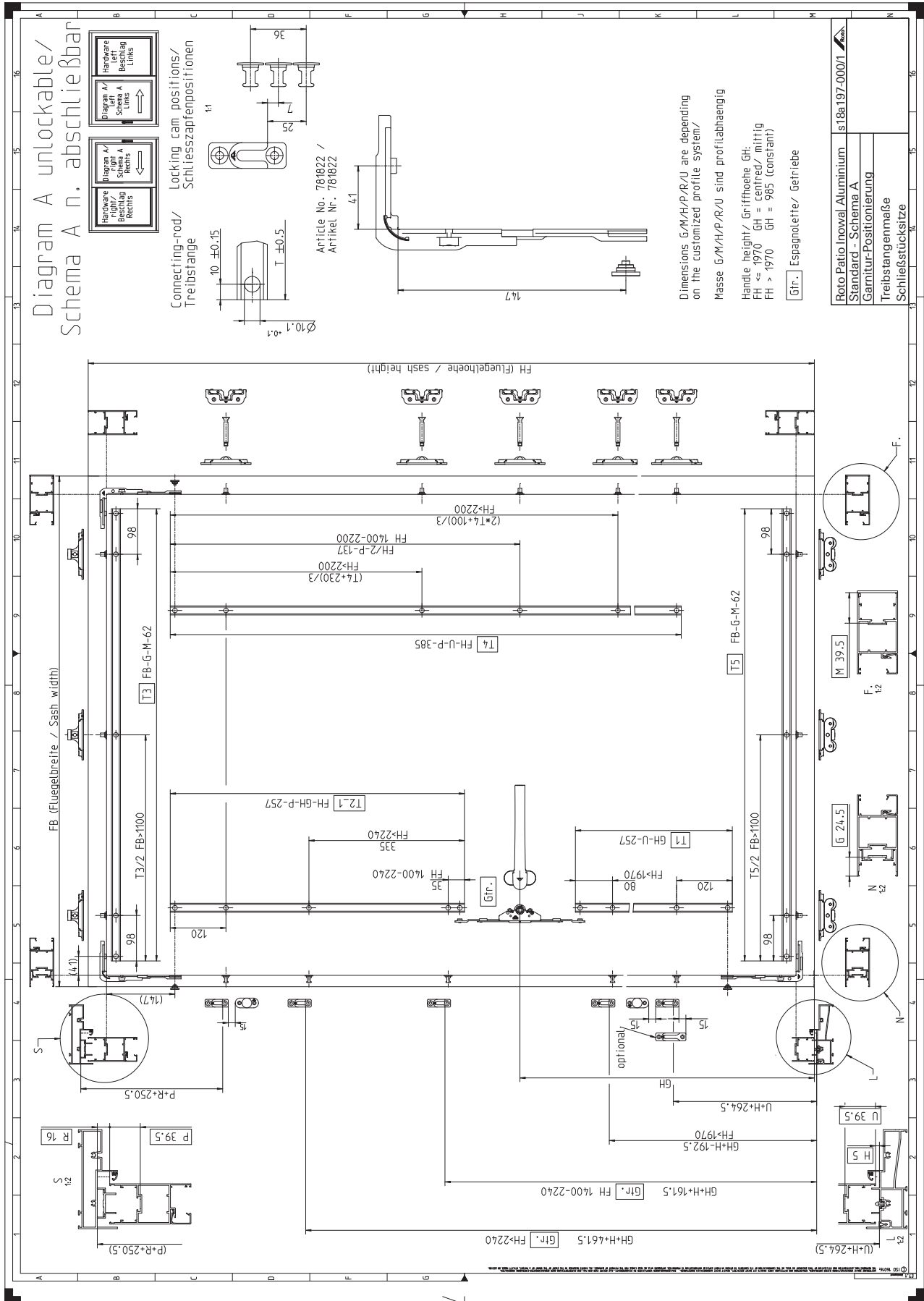
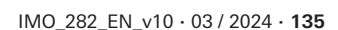
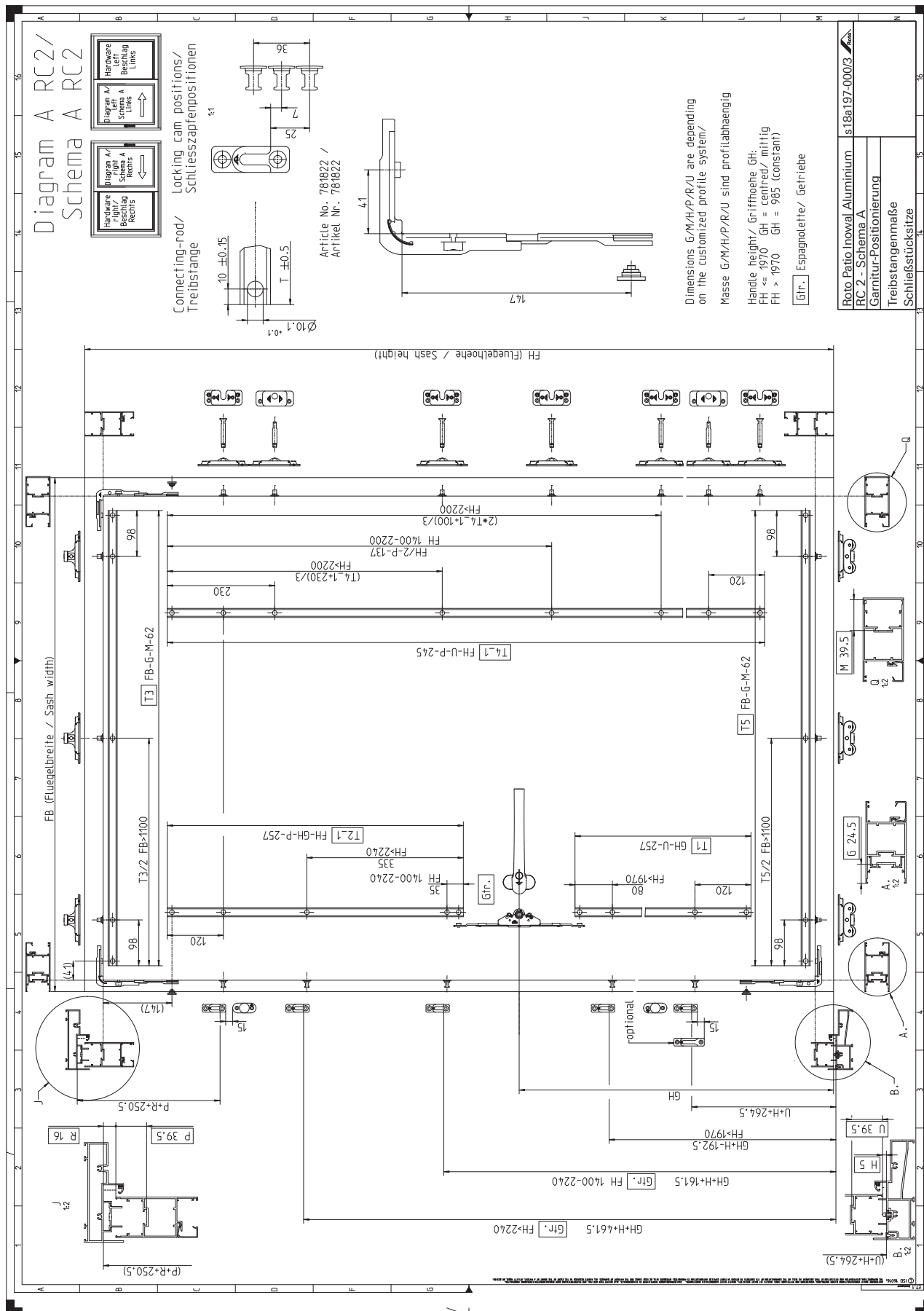


Diagram A lockable/
Schema A abschließbar



9.4 Diagram A – RC 2 / RC 2 N



[illegible]

Diagram A' RC2 / Schema A' RC2

Hardware left / Beschlag Links
Hardware right / Beschlag Rechts
Diagram A' Left / Schema A' ←
Diagram A' Right / Schema A' →

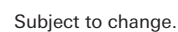
Locking cam positions / Schlüsselpositionen
Connecting-rod / Treibstange
Treibstange dimensions:
 $\varnothing 10.1^{+0.1}$
 $T \pm 0.5$
 10 ± 0.15
1:1

Article No. 781822 / Artikel Nr. 781822

Dimensions G/M/H/P/R/U are depending on the customized profile system/
Masse G/M/H/P/R/U sind profilaabhängig
Handle height / Grifffhöhe GH:
FH ≤ 1970 GH = centred / mittig
FH > 1970 GH = 985 (constant)
Gir. - Espagnolette / Getriebe

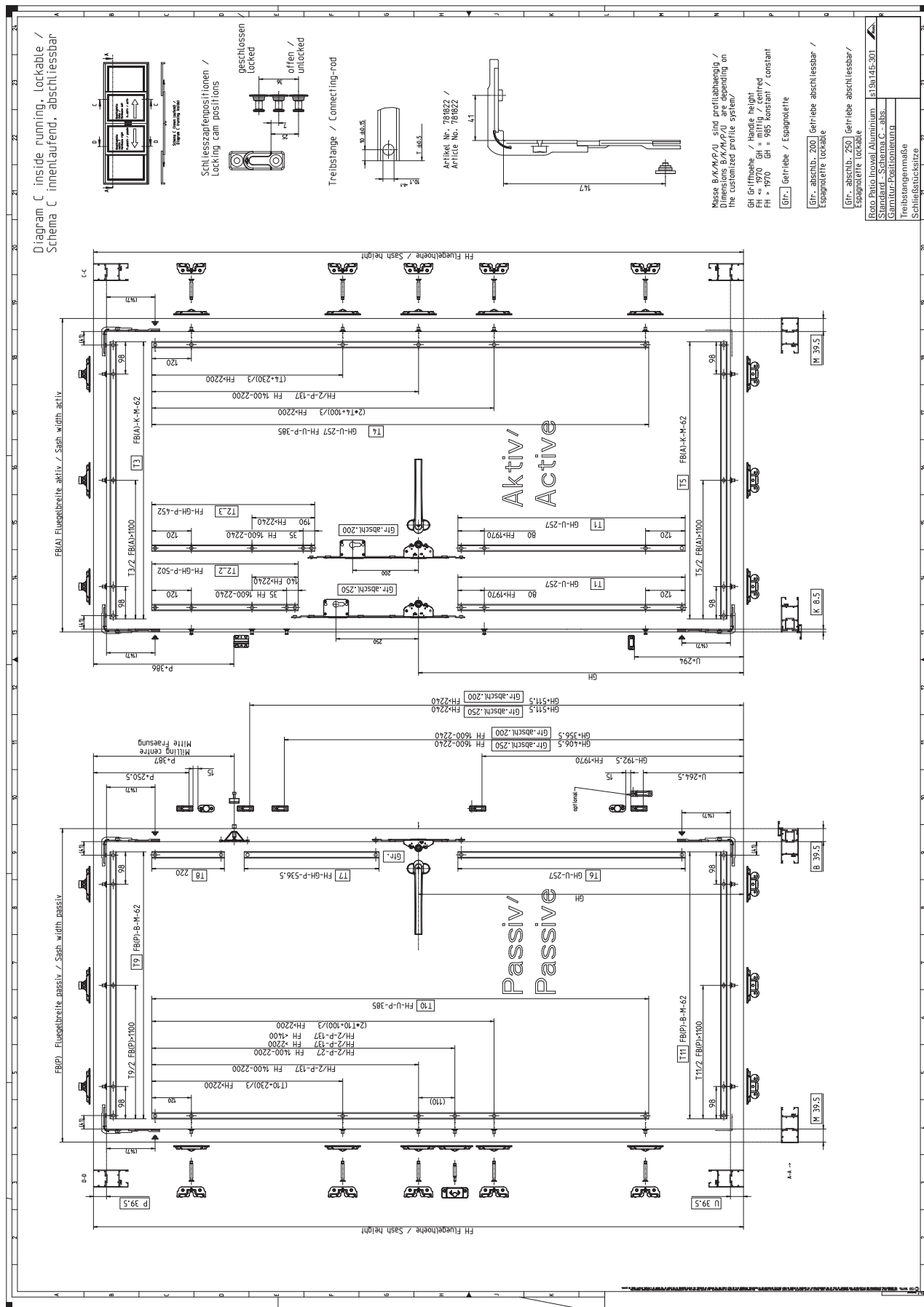
Rotopatio Inoval Aluminium s18a197.000/6
RC2 - Schema A'
Gerätur-Positionierung
Treibstangenmaße
Schließstücksitze

9.8 Diagram C

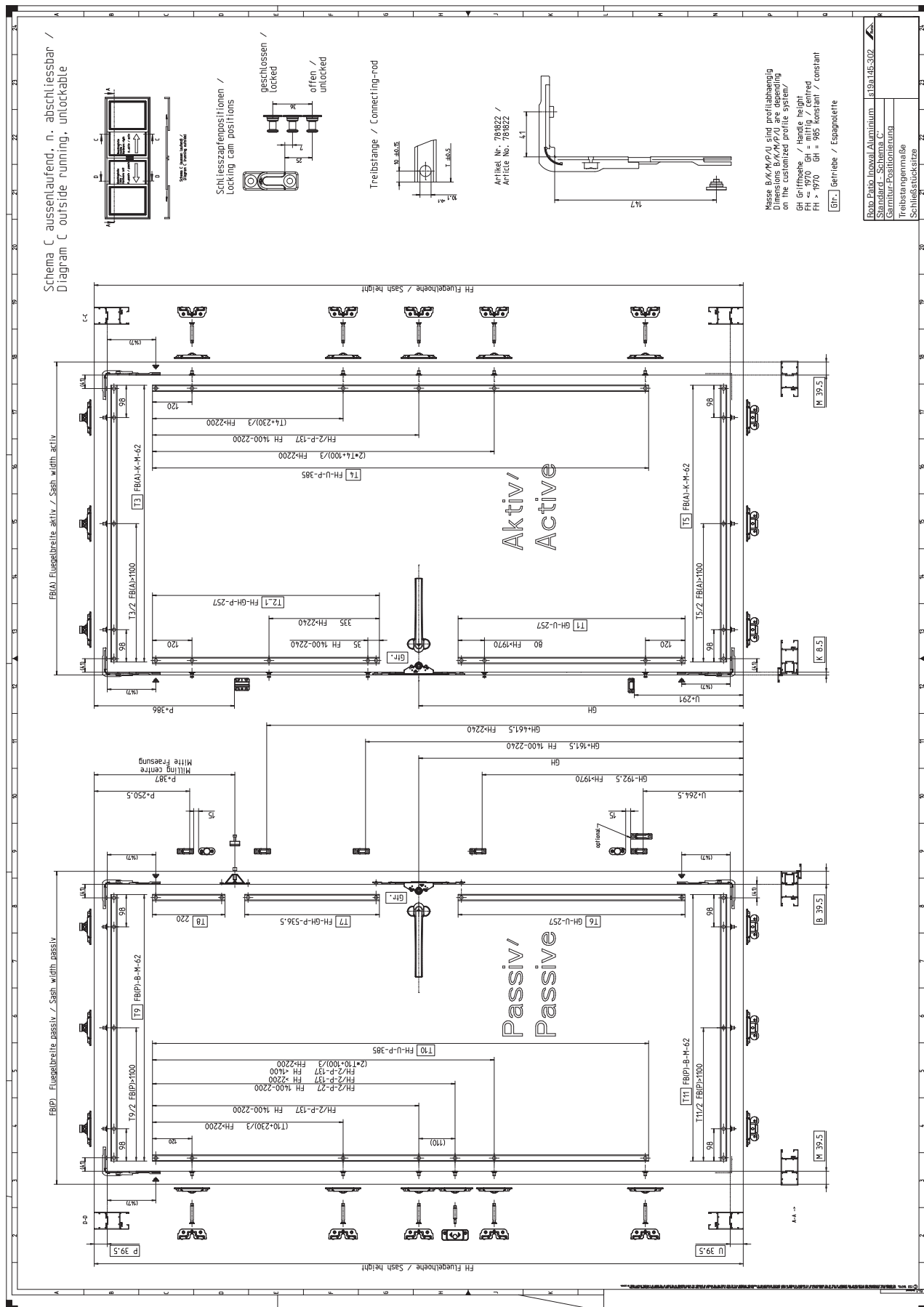




9.9 Diagram C – lockable



9.10 Diagram C'



[illegible]

10 Adjustment



INFO

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

10.1 Striker

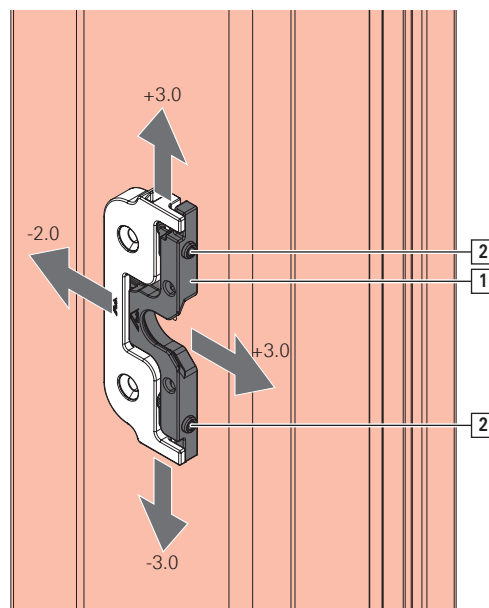
Lateral and height adjustment

1. Close the window sash (open handle position).
2. Adjust the striker [1] using two threaded pins [2] in the fastening plate.
Tool: size 2.5 hex key.



INFO

The striker features variable height adjustment, which permits an installation tolerance of ± 3 mm for the locking cam.





10.2 Mullion locking cam / pin for anti-pushback function – adjustable



CAUTION

Property damage caused by using non-adjustable components!

If non-adjustable components are adjusted, they will no longer be securely fitted in the centre closer. This may prevent the closing function from working properly or damage the frame.

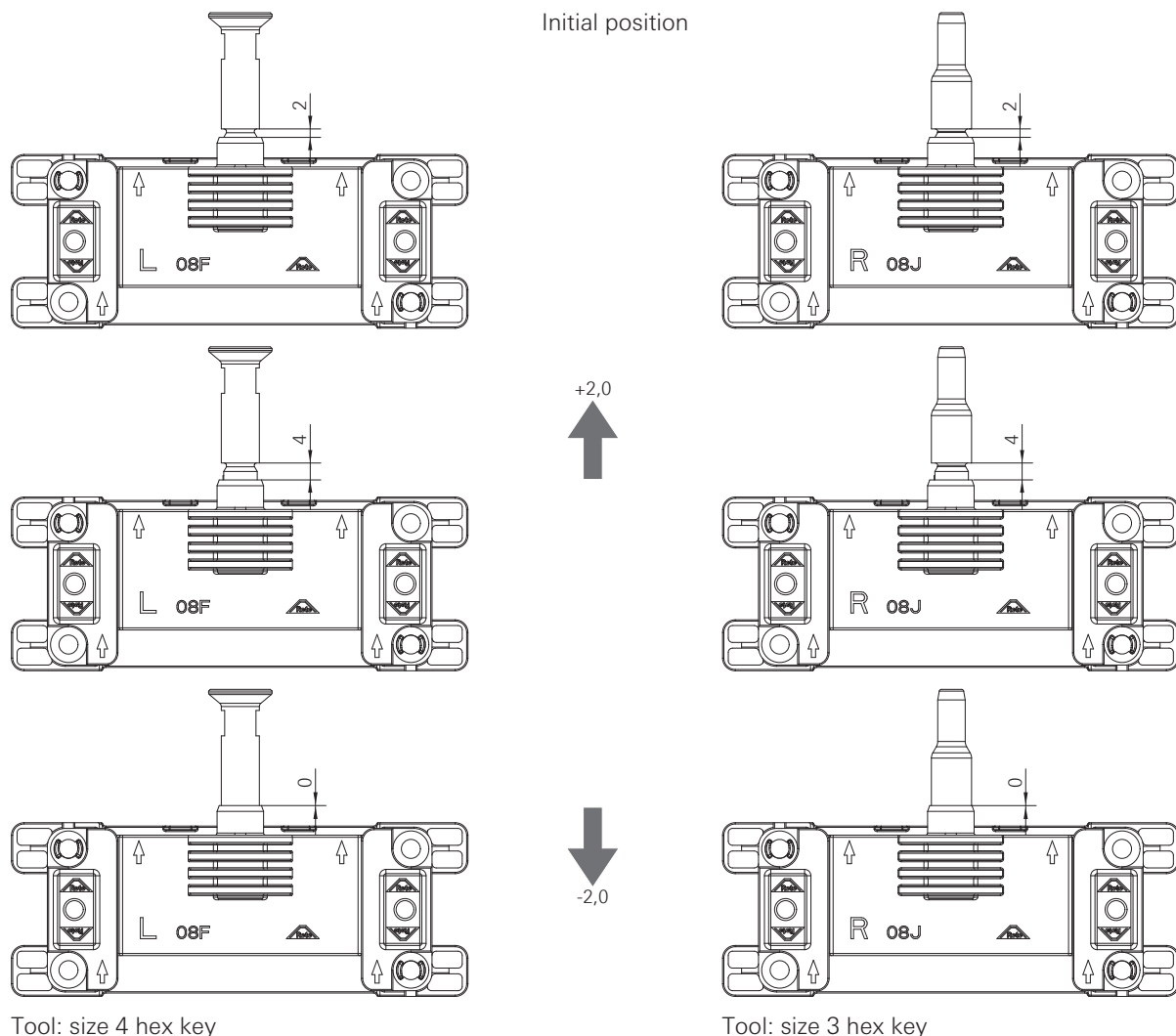
1. Check the combination of centre closer, adjustable, and mullion locking cam, adjustable, or pin for anti-pushback function, adjustable. The centre closer, adjustable has a higher flange. The locking cam and pin have an internal thread in the thread area → *from page 100*.



INFO

Roto hardware components may only be adjusted by authorised qualified personnel.

Gasket compression adjustment



11 Operation

11.1 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.

11.1.1 Roto Patio Inowa



ATTENTION

Risk of being accidentally locked out.

If the sash is in the sliding position and closes, the sash can engage and then be impossible to reopen from the outside.

- ▶ Secure the sash against accidentally engaging when in the sliding position.
- ▶ Ensure that access is possible if necessary.

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

11.2 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.	■
Handle cannot be turned 180°.	Sash components hinged or installed incorrectly.	Check the setting in the turn position (potentially re-hang – start from the T&T espagnolette).	■
		Check the connecting rod and replace if necessary.	
Locking cams brush against the striker.	Sash components hinged or installed incorrectly.	Check the setting in the turn position (potentially re-hang – start from the T&T 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



12 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 147
Cleaning		→ from page 148
Clean hardware	☐	
Care		→ from page 148
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 150
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

12.1 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.

12.2 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. → 12.3 "Care" from page 148
- ▶ Apply a thin protective film to the hardware, for example using a cloth soaked in oil.

12.3 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

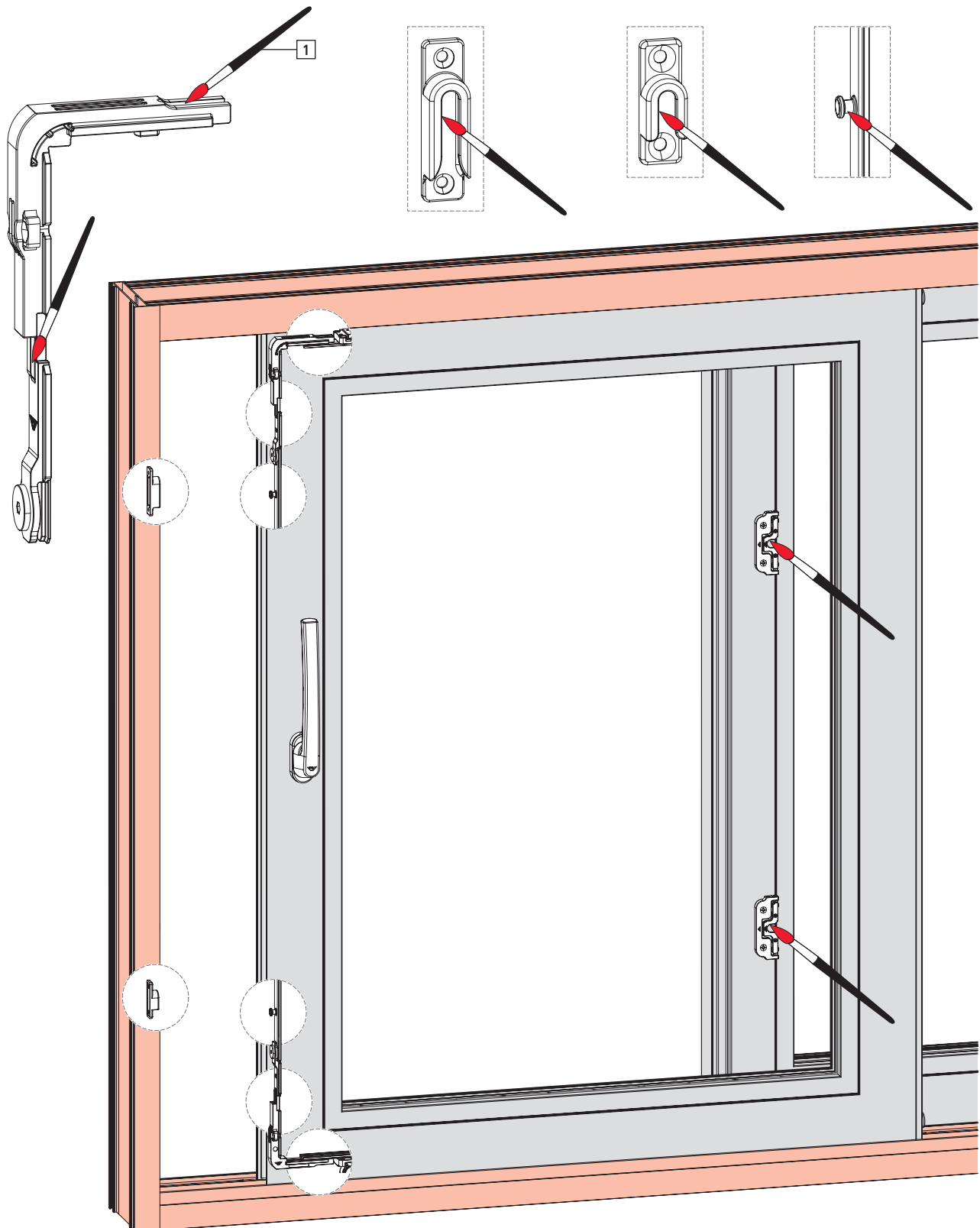


INFO

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.



12.3.1 Roto Patio Inowa



[1] Grease

12.4 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.



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.

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.

12.5 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:

- All adjustment work on the hardware,
- Replacing hardware or hardware components,
- Installing and removing windows, doors or balcony doors

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.



13 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.

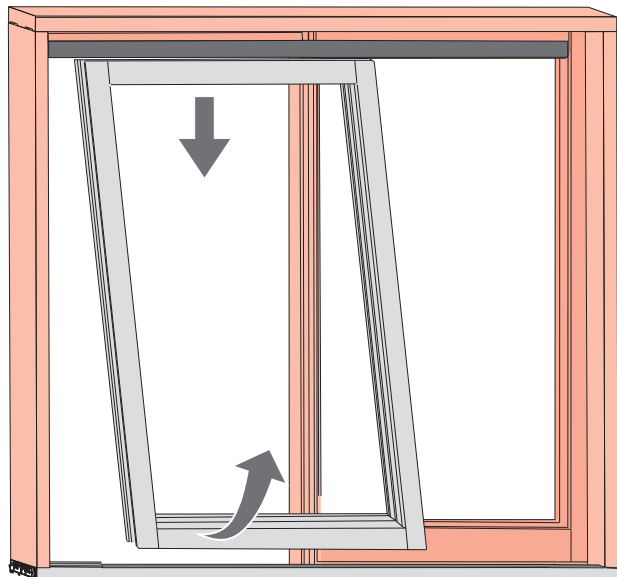
13.1 Unhinging the sash

Version with continuous operator track

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 control units are exposed.



3. Remove the sash parallel to the frame.

13.2 Hardware components

Removing hardware components

1. Undo all screw connections.
2. Remove the hardware components.

3. Dispose of the hardware components properly.



14 Transport

14.1 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 skid, open, close or fall during transportation tasks. This can result in limbs being trapped and seriously injured.

- ▶ Never reach near the scissor stays.
- ▶ 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.

14.2 Storing the hardware

Store all hardware components as follows until they are installed:

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



15 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.

15.1 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.

15.2 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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