



Roto NX

Hinge side C – Turn-Only hardware, outward opening

The Tilt&Turn hardware system for windows and balcony doors shaping the industry once again

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1 General information

1.1 Version history

Version	Date	Changes
v0	20/01/2025	Publication

1.2 Instructions

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

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

All steps must be completed in sequence.

The following documents apply in addition to these instructions:

- Catalogue
 - Roto NX – timber profiles: CTL_104
 - Roto NX – PVC profiles: CTL_105
 - Roto Handles: CTL_1

The following guidelines also apply:

www.guetegemeinschaft-schloss-beschlag.de

- Directive TBDK issued by the Gütegemeinschaft Schlösser und Beschläge e. V. quality assurance association (Attachment of supporting fitting components for turn-only and tilt&turn fittings),
- Directive VHBE issued by the Gütegemeinschaft Schlösser und Beschläge e. V. quality assurance association (Hardware for windows and balcony doors – Guidelines / advice for end-users),
- Directive VHBH issued by the Gütegemeinschaft Schlösser und Beschläge e. V. quality assurance association (Hardware for windows and balcony doors – Guidelines / advice on the product and on liability),
- ISAB information document issued by the Gütegemeinschaft Schlösser und Beschläge e. V. quality assurance association (information document about openable building elements which prevent falls),
- Directive FPKF issued by the Gütegemeinschaft Schlösser und Beschläge e. V. quality assurance association (Restrictor and cleaning stays for Tilt-Only sashes and Tilt-Only fanlights),
- ift guideline FE-18/1 Windows with opening restriction,
- Instructions and information issued by profile manufacturers (e.g. manufacturers of windows and balcony doors),
- The applicable regulations, directives and national laws.

Compliance with the following guidelines is additionally recommended:

- TLE.01 issued by the VFF (German Window and Facade Association) Correct handling of ready-to-install windows and external doors during transport, storage and installation,
- WP.01 issued by the VFF (German Window and Facade Association) Maintenance of windows, facades and external doors – Maintenance, care and inspection – Information for sales,
- WP.02 issued by the VFF (German Window and Facade Association) Maintenance of windows, facades and external doors – Maintenance, care and inspection – Measures and documents,
- WP.03 issued by the VFF (German Window and Facade Association) Maintenance of windows, facades and external doors – Maintenance, care and inspection – Maintenance agreement.

Storing the instructions

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

Explanation of the markings

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

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



INFO

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



INFO

Figures are provided in the right-hand version (DIN 107).

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
	Turn-Only window
	Sash rebate width
	Sash rebate height
	Sash weight
	Timber
	PVC

1.5 Product features

Symbol	Meaning
	Hardware axis
	Description
	Base
	Drill hole for supporting pin
	Supporting pin
	Backset
	DIN left / right
	Corner drive, integrated
	Rebate clearance
	Rebate depth
	Sash rebate width
	Sash rebate height

Symbol	Meaning
	Sash weight
	Fixed handle height
	Centred / variable handle height
	Size
	Information
	Couplable
	Length
Nº	Material number
	Installation type
	Lifting mishandling device
	Surface
	Position
	Profile
	Number of locking cams
	Type of locking cams
	Bullet catch
	Security class
	System
	Adjustment

1.6 Abbreviations

Abbreviation	Meaning
GC	Gasket compression
CTL	Catalogue
DIN L / R	DIN left / right
d _k	Screw head diameter
T&T	Tilt&Turn
BS	Backset
SRW	Sash rebate width
SRH	Sash rebate height
S.kg	Sash weight
HH	Handle height
BSec	Basic security
IMO	Installation instructions
Y	Yes
kg	Kilograms
KU	Couplable
mm	Millimetres
CL	Centre lock
N	No
Nm	Torque in newton metres
LMD	Lifting mishandling device
RC	Resistance class
BC	Bullet catch
SEC	Security
ST	Striker

1.7 Target groups

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

Hardware dealers

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

Window and balcony door manufacturers

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

Building element dealers or installation companies

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

Builders

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

End users

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



1.8 Target groups' obligation to give instructions



INFO

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

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

Responsibility of hardware dealers

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

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

Responsibility of the window and balcony door manufacturer

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

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

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

Responsibility of building element dealers and the installation company

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

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

Responsibility of the builder

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

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

1.9 Copyright protection

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

1.10 Limitation of liability

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

The hardware manufacturer assumes no liability for damage caused by:

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

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

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

The warranty only covers original Roto components.

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

1.11 Preserving the surface finish



ATTENTION

Surface treatments may cause property damage.

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

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



ATTENTION

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

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

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



ATTENTION

Contamination may cause property damage.

Contamination prevents components working properly.

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



ATTENTION

(Permanently) damp room air may cause property damage.

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

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

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

Turn-Only hardware is engagement and Turn-Only hardware for windows and balcony doors in structural engineering. This hardware is used to open window sashes and balcony door sashes by actuating a hand lever. Turn-Only hardware may be used on vertically installed windows and balcony doors made of timber, PVC, aluminium or steel, or corresponding combinations of the aforementioned materials. Turn-Only hardware as defined here locks windows and balcony door sashes or moves them into various ventilation positions. During the closing process, the gasket counter force must generally be overcome.

The hardware used here fulfils the purpose of preventing complete opening of these windows and limiting opening of these windows to a previously



agreed gap dimension to avoid falls from them. As an additional function, it is possible for instructed personnel to deactivate the opening restrictors using a special tool or key if required, for example to clean the windows.

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.

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. The product can be used without restrictions under the warranty if the stipulated use is adhered to.

Observe the following usage restriction: opened sashes in windows and balcony doors, and window sashes and balcony door sashes that are unlocked or placed in ventilation positions, only have a shielding effect.



WARNING

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

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

- ▶ When operating the sash, do not lean too far outward.
- ▶ 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 pressing the restrictor, hold on to the sash with your other hand to prevent it from falling back. One hand on the restrictor, one on the handle.



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.

- ▶ When opening the sash, watch out for obstacles on the building (e.g. window sills, protruding roller shutter boxes, etc.).
- ▶ 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.

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

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

Open window sashes, and windows 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 Basic safety information

The following hazards may arise when handling the product:

2.4.1 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 smaller loads with an ergonomically correct posture.

2.4.2 Use

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

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

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

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

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



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

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

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

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

Misuse poses a risk of injury and property damage.

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

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

2.4.3 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 radiators 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.

2.5 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>Avoid placing additional loads on the sash.</p>
	<p>Very windy conditions pose an immediate risk of death or serious injuries and property damage.</p> <p>Avoid exposing the open sash to wind.</p> <p>Close and lock the window and balcony door sash in windy or draughty conditions.</p>



Symbol	Meaning
	<p>Introducing obstacles into the opening between sash and frame may result in minor injuries and property damage.</p> <p>Avoid introducing obstacles into the opening between sash and frame.</p>
	<p>Pressing the sash against the edge of an opening (reveal) may pose a risk of minor injuries and cause property damage</p> <p>Refrain from pressing the sash against the edge of an opening (reveal).</p>

3 Information on the product

3.1 General hardware characteristics

- Central locking system fully concealed in the sash rebate with one-handle operation:
 - Profiled faceplate
 - Effortless and low-wear operation thanks to adjustable locking cams guided over the surface
- Simple adjustment options for lateral and height adjustment; additional gasket compression adjustment via:
 - E locking cam: gasket compression adjustable eccentric cam
 - P locking cam: gasket compression adjustable security eccentric cam
 - V locking cam: gasket compression and height adjustable security eccentric cam
- Stay bearing and pivot rest fully concealed in the sash rebate.
- 3D adjustment in the stay arm, corner hinge and pivot rest.
- Lasting and reliable load relief on the pivot rest.
- Form-fitting "Clip&Fit" connection.
- Low-maintenance thanks to grease deposit recesses.
- Tested in accordance with EN 13126-8 and EN 1191 and certified in accordance with QM 328.
- High-quality Roto Sil surface (matt silver) for maximum corrosion resistance (DIN EN 13126 / 8 and free from chromium VI compounds).

In combination with Roto Sil, Roto Sil Level 6 is an advanced standard for connection components subject to high stress, such as rivets, bolts and sliding elements.
- Ten-year warranty for the functionality of the hardware.

3.2 General information

Hardware functional safety

The following points must be noted in order to ensure the functional safety of the hardware at all times:

1. Correct installation of hardware components in accordance with the installation instructions.
2. Correct installation of elements during window installation.
3. The window manufacturer must pass the maintenance and operation instructions and the product liability guidelines (if applicable) on to the user.
4. The hardware as a whole may only consist of original Roto system components. The use of components from other manufacturers excludes any liability.

Product liability regulations

Electrogalvanised and passivated steel fenestration screws are to be used to fasten the hardware components.

The window manufacturer must ensure that the hardware components are adequately secured; the screw manufacturer must be involved if required.

When attaching security-relevant, load-bearing hardware components (hinge sides), the manufacturer of windows and balcony doors must prove the specified forces in accordance with the table below (excerpt from Directive TBDK issued by the Gütegemeinschaft Schlösser und Beschläge e. V. quality assurance association) by means of testing and ensure them on their product.



INFO

Observe directive TBDK for tractive force values as a function of the sash weights.

Further information can be found at www.guetegemeinschaft-schloss-beschlag.de.

Do not use any acid cross-linked sealing compounds that could lead to corrosion of the hardware components. The spacer block guidelines for glazing methods must be complied with.

Product liability – liability exclusion

The hardware manufacturer is not liable for malfunctions or damage to the hardware, or to windows and balcony doors equipped with the hardware, if this has been caused by insufficient invitation to tender or failure to comply with the installation specifications and application diagrams, or if the hardware has been subjected to increased levels of dirt.

The warranty only covers original Roto components.



Profile classification – application ranges

The individual application diagrams must strictly be complied with.

When determining the maximum permitted sash formats and sash weights, the values specified by the profile manufacturers and system owners must not be exceeded either.

3.3 Notes for outward opening windows

Installation situations

- Except for on the ground floor, floor-to-ceiling elements are only permitted if additional protection is provided, e.g. railings. Should this not be the case, the barrier must be at least 90 cm tall.
Refer to the relevant state building regulations for the fall heights above which protection is required.

Tilt stay

- Tilt stays are not a security component in accordance with DIN EN 13126-5.
- Tilt stays do not prevent falls.
- Tilt stays do not have a braking effect. The sash can fall shut due to the force of the wind.
- Tilt stays need to be unhinged, e.g. for adjustment. This work can only be carried out from the outside (e.g. facade lift).

Adjustment



INFO

In order to adjust the

- pivot rest,
- corner hinge,
- sash stay,
- gasket compression at the locking cams,

the tilt stays have to be unhinged so that the sash can be opened to 90°. This work can only be carried out from the outside (e.g. facade lift).

3.4 Application diagrams

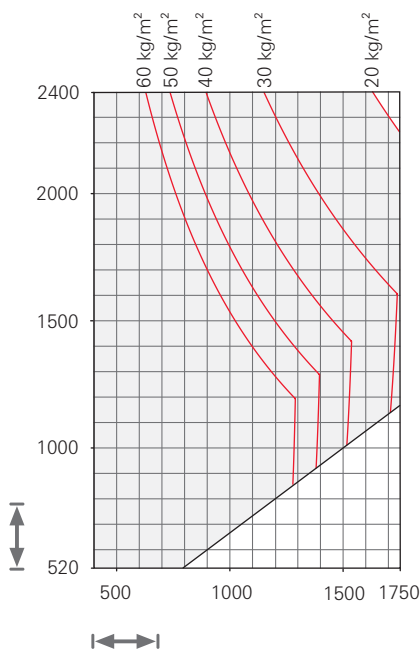
3.4.1 Turn-Only hardware

3.4.1.1 100 kg



INFO

For information on using and reading application diagrams, e.g. for interpolation (calculating missing intermediate values), see BRO_347 (Roto application diagrams).



= Impermissible application range

Test and calculation principles:

Tilt&Turn test in accordance with QM 328 – hardware certification programme in accordance with DIN EN 13126-8 – class H3

Deductible dimension of glass = 28 mm

(Sash) profile weight = 3.25 kg/m

Lower deductible dimensions of glass or higher profile weights require a separate assessment.



INFO

Evidence on the attachment of load-bearing components to the window system by the window manufacturer in accordance with TBDK with the following forces:

- on the stay bearing 2710 N
- on the pivot rest 2890 N

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

1 mm/m² glass thickness $\approx$ 2.5 kg

Glass weight max. 60 kg/m²

Application range		
	Sash width	400 – 1750 mm
	Sash height	520 – 2400 mm
	Sash weight	Max. 100 kg



INFO

Observe directive TBDK for tractive force values as a function of the sash weights.

Further information can be found at www.guetegemeinschaft-schloss-beschlag.de.

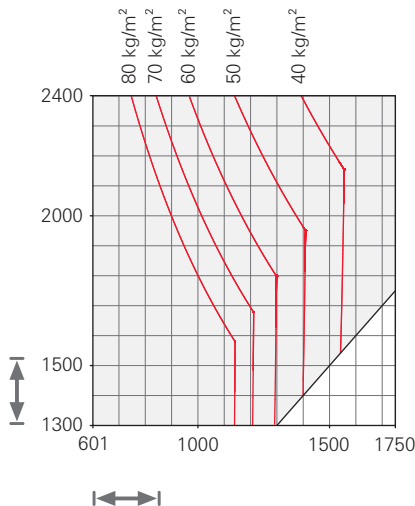


3.4.1.2 Load transfer from 80 to 150 kg



INFO

For information on using and reading application diagrams, e.g. for interpolation (calculating missing intermediate values), see BRO_347 (Roto application diagrams).



Impermissible application range

Test and calculation principles:

Tilt&Turn test in accordance with QM 328 – hardware certification programme in accordance with DIN EN 13126-8 – class H3

Deductible dimension of glass = 28 mm

(Sash) profile weight = 3.25 kg/m

Lower deductible dimensions of glass or higher profile weights require a separate assessment.



INFO

Evidence on the attachment of load-bearing components to the window system by the window manufacturer in accordance with TBDK with the following forces:

- on the stay bearing 4200 N
- on the pivot rest 4340 N

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

1 mm/m² glass thickness ≈ 2.5 kg

Glass weight max. 80 kg/m²

Application range		
	Sash width	601 – 1750 mm
	Sash height	1300 – 2400 mm
	Sash weight	Max. 150 kg



INFO

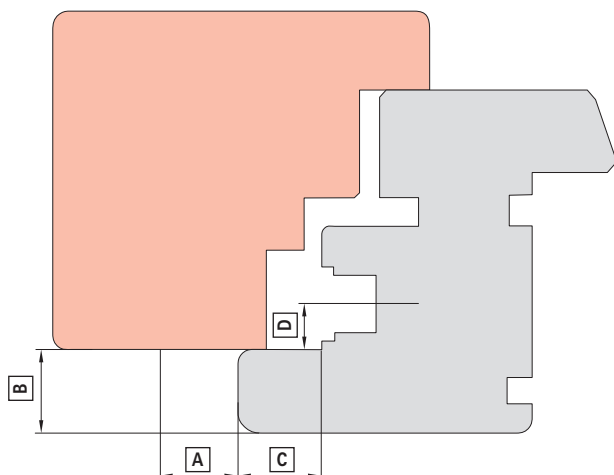
Observe directive TBDK for tractive force values as a function of the sash weights.

Further information can be found at www.guetegemeinschaft-schloss-beschlag.de.

3.5 Frame clearances

3.5.1 Timber

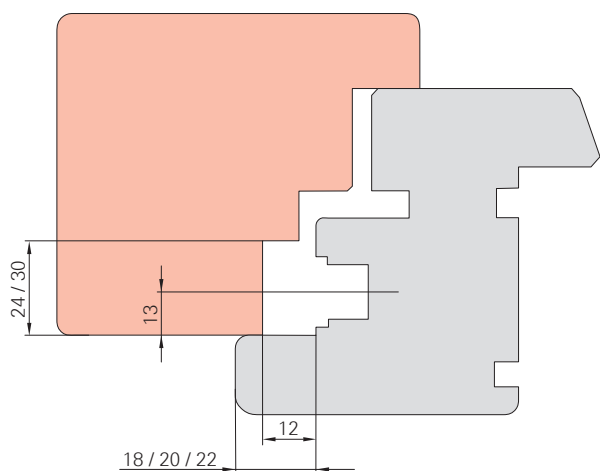
3.5.1.1 Frame clearances with a 90° opening angle



Axis dimension [A]	Overlap height [H]	Overlap width [B]	Frame clearance [X]
13	16	18	1.7
	20	18	5.7
	24	18	9.7
	16	20	-0.3
	20	20	3.7
	24	20	7.7
	16	22	-2.3
	20	22	1.7
	24	22	5.7

3.5.1.2 Dimensions

Euro-rebate system 12/18 (20/22)-13



Rebate depth: 24 / 30

Rebate clearance, horizontal at the bottom: 11 – 14 mm

Rebate clearance at the side: 10 – 14 mm

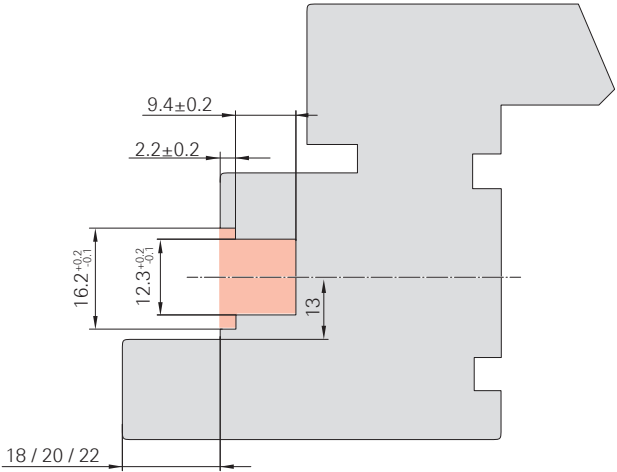
Horizontal rebate clearance at the top: 11 – 14 mm



INFO

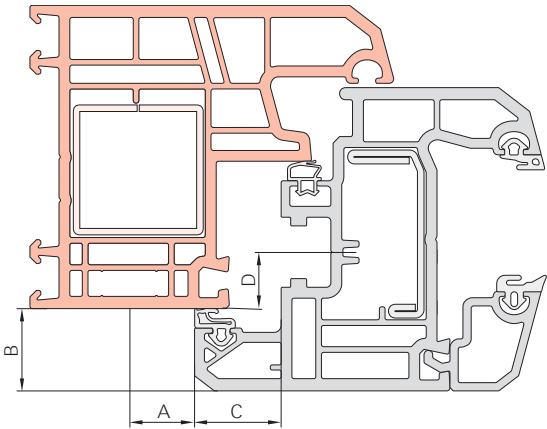
Pivot rest preset to 12 mm rebate clearance.

Sash profile cross section



3.5.2 PVC

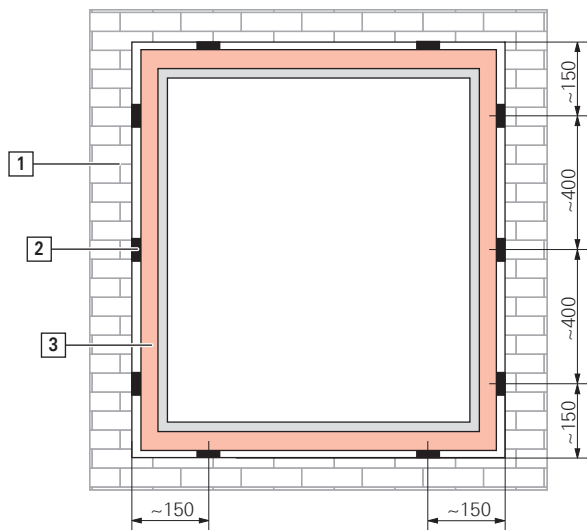
3.5.2.1 Frame clearances with a 90° opening angle



Axis dimension [A]	Overlap height [H]	Overlap width [B]	Frame clearance [X]
13	16	18	1.7
	20	18	5.7
	24	18	9.7
	16	20	0
	20	20	3.7
	24	20	7.7
	16	22	0
	20	22	1.7
	24	22	5.7

The dimensions in the table apply to components in the delivery state (not adjusted).

3.6 Mounting suggestion for security windows



- [1] Masonry
- [2] Spacer blocks
- [3] Frame



INFO

Attach spacer blocks in the vicinity of the screw fixings for the security strikers.

Burglar inhibiting windows in accordance with DIN EN 1627 – 1630 may only be designated as such if installation is performed in accordance with the specified standard in all aspects.



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.

Additional combinations of hardware components can be found in the catalogue.

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

The actual composition of the hardware depends on:

- the width of the element
- the height of the element
- the weight of the element
- the resistance class
- the profile system

Application range

The applicable application range [A] depends on the opening type and resistance class. The application range of the individual components [B] may differ from the applicable application range [A].

Anwendungsbereich

FFB: 290 - 1600 mm

[A] — **FFH:** 430 - 2800 mm

FG: max. 150 kg

[1] DK-Getriebe KSR – Griffsitz konstant, Dornmaß 15 mm

									Nº
[B] —	280 – 570	120	460	J	N	–	–	–	742199
	511 – 710	170	600	J	J	–	–	–	795324
	601 – 800	263	690	N	J	–	–	–	619591
	801 – 1000	413	890	N	J	1	E	–	619592
	1001 – 1200	513	1090	N	J	1	E	–	619593
	1201 – 1400	563	1290	N	J	1	E	–	619594
	1401 – 1600	563	1490	N	J	2	E	–	619595
	1601 – 1800	563	1690	N	J	2	E	–	619596
	1601 – 1800	1000	1690	N	J	2	E	–	838345
	1801 – 2000	1000	1890	N	J	2	E	–	794637
	2001 – 2200	1000	2090	N	J	3	E	–	794638
	2201 – 2400	1000	2290	N	J	3	E	–	794639

Example

The highlighted T&T espagnolette can generally be used from a SRH of min. 280 mm [B]. With this opening type and resistance class, elements are only allowed to be constructed from an SRH of 430 mm [A] and above. The highlighted T&T espagnolette is in the specified range and can therefore be installed.

**INFO****Resistance classes**

- The RC 1 N, RC 2, RC 2 N and RC 3 resistance classes refer to the entire system.
- The hardware combinations shown in the hardware overviews are recommendations.
- 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.
- Steel security locking components must generally be used in systems with a 9 mm hardware axis.

Profile-related frame components and general sets are listed in additional chapters.

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 High backset espagnolette (T&T espagnolette BS ≥ 25)

4.1.1 Basic security

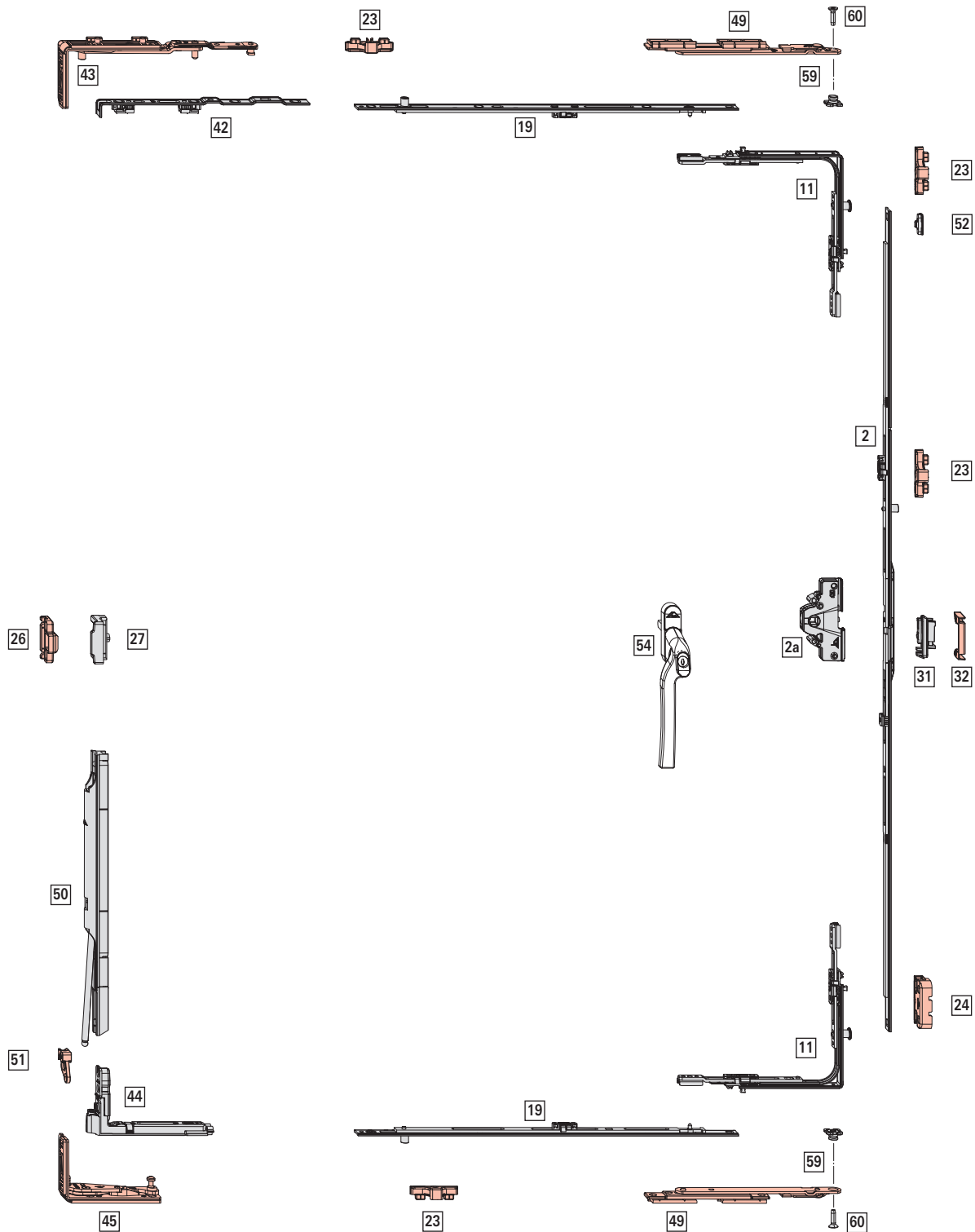


Fig. 4.1: Figure for a PVC profile; use corresponding components for timber profiles.



Application range

Without load transfer

SRW: 400 – 1750 mm

SRH: 520 – 2400 mm

S.kg: max. 100 kg

With load transfer

SRW: 600 – 1750 mm

SRH: 1000 – 2400 mm

S.kg: max. 150 kg

[2] T&T espagnolette – centred / variable handle height, backset ≥ 25 mm

							Nº
430 – 920	215 – 460	700	N	N	–	–	840759
621 – 800	311 – 400	580	Y	N	1	E	788318
801 – 1200	401 – 600	980	Y	N	1	E	788320
1201 – 1600	601 – 800	1380	Y	N	2	E	788322
1601 – 2000	801 – 1000	1780	Y	Y	2	E	788324
2001 – 2400	1001 – 1200	2180	Y	Y	4	E	788326

[2a] Gearbox, backset 25 mm

	Nº
25	787675

Optional

	Nº
30	787677
35	787678

[11] Standard corner drive

		Nº
1	P	260277



INFO

SRW 400 – 415 mm: crop the corner drive at the top.

[19] Multipart centre lock – standard, horizontal

				Nº
400	N	1	E	255280
600	N	1	E	255281
600	Y	1	E	255282

Size-specific combinations:

PVC

				Nº
801 – 1200	400	1	E	255280
1201 – 1400	600	1	E	255281
1401 – 1750	600 KU	1	E	255282
	400	1	E	255280

Timber

				Nº
1101 – 1600	600	1	E	255281
1601 – 1750	600 KU	1	E	255282
	400			255280

[23] Striker → from page 57

[24] Security striker → from page 58

[26] Centre closer, concealed, frame component

[27] Centre closer, concealed, sash component

[31] Bullet catch sash component (optional SRH ≥ 1601 mm)

	Nº
Bullet catch sash component	788363

[32] Bullet-catch frame component (optional SRH ≥ 1601 mm) → from page 67

[42] Rebate stay guide

		Nº
For Turn-Only sashes	220 / 15	2005701

[43] Rebate stay arm → from page 56

[44] Corner hinge

		Nº
12/18-13 12/20-13	Left	2005290
12/18-13 12/20-13	Right	2005291

[45] Pivot rest → from page 57

	Nº
max. 180 kg	2005292

[49] Packer → from page 62

[50] Load transfer sash component (SRW ≥ 600 mm, SRH ≥ 1000 mm)

	Nº
max. 180 kg	2005293

[51] Load transfer frame component (SRW ≥ 600 mm, SRH ≥ 1000 mm)

	Nº
max. 180 kg	2005292

[52] 90° travel restrictor

	Nº
Travel restrictor	264603

[54] Handle → CTL_1

[59] Tilt stay set for floating-mullion installation

	Nº
Floating-mullion installation	482823

[60] Mounting screw	
	Nº
Screw for installation on corner drive	567995



4.1.2 RC 1 N – centre closers

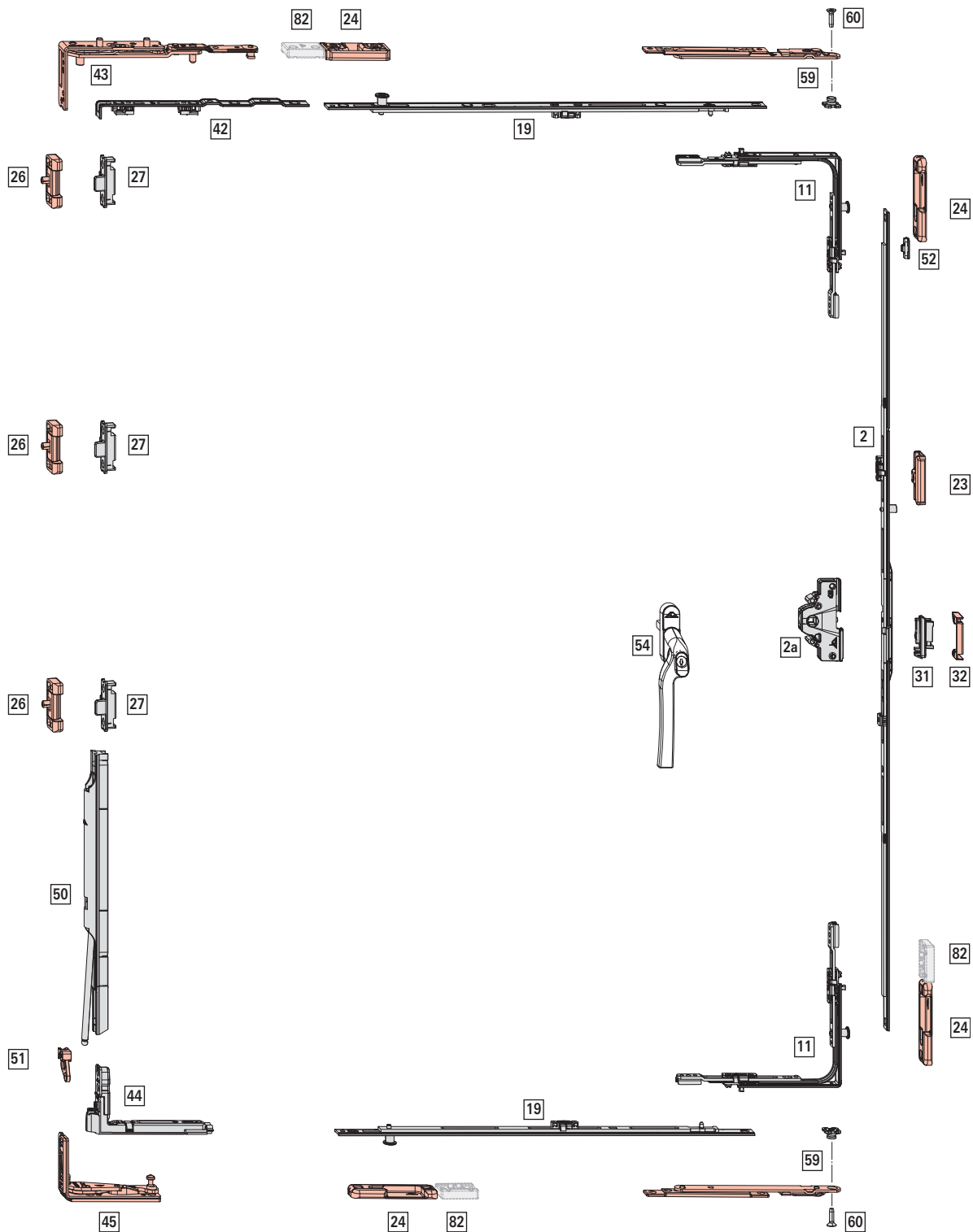


Fig. 4.2: Figure for timber profiles; PVC profiles available upon request



Application range

Without load transfer

SRW: 650 – 1600 mm

SRH: 520 – 2400 mm

S.kg: max. 100 kg

With load transfer

SRW: 650 – 1600 mm

SRH: 1000 – 2400 mm

S.kg: max. 150 kg

[2] T&T espagnolette – centred / variable handle height, backset ≥ 25 mm

								Nº
430 – 920	215 – 460	700	N	N	–	–	–	840759
621 – 800	311 – 400	580	Y	N	1	E	–	788318
801 – 1200	401 – 600	980	Y	N	1	E	–	788320
1201 – 1600	601 – 800	1380	Y	N	2	E	–	788322
1601 – 2000	801 – 1000	1780	Y	Y	2	E	–	788324
2001 – 2400	1001 – 1200	2180	Y	Y	4	E	–	788326

[2a] Gearbox, backset 25 mm

	Nº
25	787675

Optional

	Nº
30	787677
35	787678

[11] Standard corner drive

		Nº
1	P	260277

[19] Multipart centre lock – standard, horizontal

				Nº
200	N	1	P	255284
400	N	1	P	255285
600	N	1	P	255286
600	Y	1	E	255282

Size-specific combinations:

top

				Nº
650 – 750	200	1	P	255284
751 – 950	400	1	P	255285
951 – 1150	600	1	P	255286
1151 – 1350	600 KU	1	E	255282
	200	1	P	255284
1351 – 1550	600 KU	1	E	255282
	400	1	P	255285
1551 – 1600	600 KU	1	E	255282
	600	1	P	255286

bottom

				Nº
650 – 850	400	1	P	255285
851 – 1050	600	1	P	255286
1051 – 1250	600 KU	1	E	255282
	200	1	P	255284
1251 – 1450	600 KU	1	E	255282
	400	1	P	255285
1451 – 1600	600 KU	1	E	255282
	600	1	P	255286

[23] Striker → from page 57

[24] Security striker → from page 58

[26] Centre closer, concealed, frame component

[27] Centre closer, concealed, sash component

[31] Bullet catch sash component (optional SRH ≥ 1601 mm)

	Nº
Bullet catch sash component	788363

[32] Bullet-catch frame component (optional SRH ≥ 1601 mm) → from page 67

[42] Rebate stay guide

		Nº
For Turn-Only sashes	220 / 15	2005701

[43] Rebate stay arm → from page 56

[44] Corner hinge

		Nº
12/18-13 12/20-13	Left	2005290
12/18-13 12/20-13	Right	2005291

[45] Pivot rest → from page 57

	Nº
max. 180 kg	2005292

[50] Load transfer sash component (SRW ≥ 600 mm, SRH ≥ 1000 mm)

	Nº
max. 180 kg	2005293

[51] Load transfer frame component (SRW ≥ 600 mm, SRH ≥ 1000 mm)

	Nº
max. 180 kg	2005292

Hardware overviews

High backset espagnolette (T&T espagnolette BS ≥ 25)

RC 1 N – centre closers

[52] 90° travel restrictor

	Nº
Travel restrictor	264603

[54] Handle → CTL_1

[59] Tilt stay set for floating-mullion installation

	Nº
Floating-mullion installation	482823

[60] Mounting screw

	Nº
Screw for installation on corner drive	567995

Optional

[82] Anti-jemmy device

		Nº
13	From rebate depth 24 mm	792786



4.1.3 RC 1 N

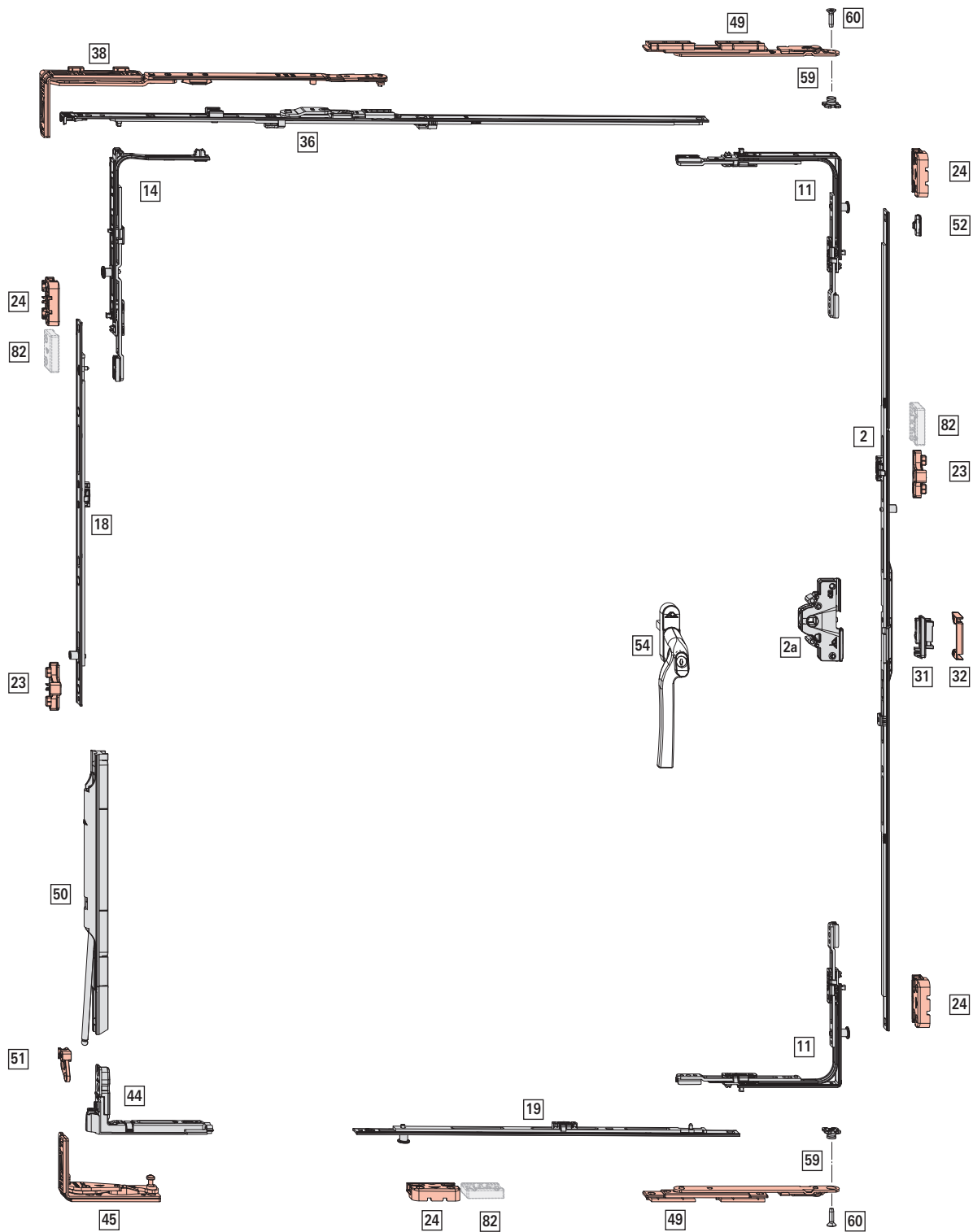


Fig. 4.3: Figure for a PVC profile; use corresponding components for timber profiles.



Application range

Without load transfer

SRW: 650 – 1600 mm

SRH: 520 – 2400 mm

S.kg: max. 100 kg

With load transfer

SRW: 650 – 1600 mm

SRH: 1000 – 2400 mm

S.kg: max. 150 kg

[2] T&T espagnolette – centred / variable handle height, backset ≥ 25 mm

						N°
430 – 920	215 – 460	700	N	N	–	840759
621 – 800	311 – 400	580	Y	N	1	788318
801 – 1200	401 – 600	980	Y	N	1	788320
1201 – 1600	601 – 800	1380	Y	N	2	788322
1601 – 2000	801 – 1000	1780	Y	Y	2	788324
2001 – 2400	1001 – 1200	2180	Y	Y	4	788326

[2a] Gearbox, backset 25 mm

	N°
25	787675

Optional

	N°
30	787677
35	787678

[11] Standard corner drive

	N°
1	260277

[14] Sash stay corner drive

	N°
1	260286

[18] Multipart centre lock – standard, vertical

			N°
400	N	1	255280
600	N	1	255281
600	Y	1	255282
200	N	1	255284

Size-specific combinations:

PVC

without load transfer

				N°
801 – 1200	400	1	E	255280
1201 – 1400	600	1	E	255281
1401 – 1800	600 KU	1	E	255282
	400	1	E	255280

				N°
1801 – 2000	600 KU	1	E	255282
	600	1	E	255281
2001 – 2400	600 KU	1	E	255282
	600 KU	1	E	255282
	400	1	E	255280

With load transfer

				N°
1001 – 1200	400	1	E	255280
1201 – 1400	600	1	E	255281
1401 – 1600	600 KU	1	E	255282
	200	1	P	255284
1601 – 1800	600 KU	1	E	255282
	400	1	E	255280
1801 – 2000	600 KU	1	E	255282
	600	1	E	255281
2001 – 2200	600 KU	1	E	255282
	600 KU	1	E	255282
	200	1	P	255284
2201 – 2400	600 KU	1	E	255282
	600 KU	1	E	255282
	400	1	E	255280

Timber

without load transfer

				N°
1101 – 1800	600	1	E	255281
1801 – 2400	600 KU	1	E	255282
	600	1	E	255281

With load transfer

				N°
1101 – 1150	400	1	E	255280
1151 – 1800	600	1	E	255281
1801 – 2400	600 KU	1	E	255282
	600	1	E	255281

[19] Multipart centre lock – standard, horizontal

			N°
200	N	1	255284
400	N	1	255285
600	N	1	255286
600	Y	1	255282

Size-specific combinations:

				N°
650 – 850	400	1	P	255285
851 – 1050	600	1	P	255286
1051 – 1250	600 KU	1	E	255282
	200	1	P	255284

Hardware overviews

High backset espagnolette (T&T espagnolette BS ≥ 25)

RC 1 N

				Nº
1251 – 1450	600 KU	1	E	255282
	400	1	P	255285
1451 – 1600	600 KU	1	E	255282
	600	1	P	255286

[23] Striker → from page 57

[24] Security striker → from page 58

[31] Bullet catch sash component (optional SRH ≥ 1601 mm)

	Nº
Bullet catch sash component	788363

[32] Bullet-catch frame component (optional SRH ≥ 1601 mm) → from page 67

[36] Stay guide – basic security

					Nº
601 – 800	350	690	–	–	2005272
801 – 1000	500	890	1	E	2005273
1001 – 1200	500	1090	1	E	2005274
1201 – 1400	500	1290	1	E	2005275

[38] Stay arm → from page 54

[44] Corner hinge

		Nº
12/18-13 12/20-13	Left	2005290
12/18-13 12/20-13	Right	2005291

[45] Pivot rest → from page 57

	Nº
max. 180 kg	2005292

[49] Packer → from page 62

[50] Load transfer sash component (SRW ≥ 600 mm, SRH ≥ 1000 mm)

	Nº
max. 180 kg	2005293

[51] Load transfer frame component (SRW ≥ 600 mm, SRH ≥ 1000 mm)

	Nº
max. 180 kg	2005292

[52] 90° travel restrictor

	Nº
Travel restrictor	264603

[54] Handle → CTL_1

[59] Tilt stay set for floating-mullion installation

	Nº
Floating-mullion installation	482823

[60] Mounting screw

	Nº
Screw for installation on corner drive	567995

Optional

[82] Anti-jemmy device

		Nº
13	From rebate depth 24 mm	792786



4.2 TSH 30

4.2.1 Basic security



Fig. 4.4: Figure for a PVC profile; use corresponding components for timber profiles.



Application range

Without load transfer

SRW: 400 – 1750 mm

SRH: 600 – 2200 mm

S.kg: max. 100 kg

With load transfer

SRW: 600 – 1750 mm

SRH: 1000 – 2400 mm

S.kg: max. 150 kg

[2] Espagnolette – TSH 30, backset 25 mm

				Nº
25	800	1	P	616428

Optional

				Nº
20	800	1	P	611958
22	800	1	P	611959

[6] Centre lock, multipart

				Nº
200	Y	–	–	308267
400	Y	1	E	280346
600	Y	1	E	255282

Size-specific combinations:

				Nº
1001 – 1400	200 KU	–	–	308267
1401 – 1800	400 KU	1	E	280346
1801 – 2200	600 KU	1	E	255282

[11] Standard corner drive

		Nº
1	P	260277



INFO

SRW 400 – 415 mm: crop the corner drive at the top.

[19] Multipart centre lock – standard, horizontal

				Nº
400	N	1	E	255280
600	N	1	E	255281
600	Y	1	E	255282

Size-specific combinations:

PVC

				Nº
801 – 1200	400	1	E	255280
1201 – 1400	600	1	E	255281
1401 – 1750	600 KU	1	E	255282
	400	1	E	255280

Timber

				Nº
1101 – 1600	600	1	E	255281
1601 – 1750	600 KU	1	E	255282
	400	1	E	255280

[23] Striker → from page 57

[24] Security striker → from page 58

[26] Centre closer, concealed, frame component

[27] Centre closer, concealed, sash component

[42] Rebate stay guide

		Nº
For Turn-Only sashes	220 / 15	2005701

[43] Rebate stay arm → from page 56

[44] Corner hinge

		Nº
12/18-13 12/20-13	Left	2005290
12/18-13 12/20-13	Right	2005291

[45] Pivot rest → from page 57

	Nº
max. 180 kg	2005292

[49] Packer → from page 62

[50] Load transfer sash component
(SRW ≥ 600 mm, SRH ≥ 1000 mm)

	Nº
max. 180 kg	2005293

[51] Load transfer frame component
(SRW ≥ 600 mm, SRH ≥ 1000 mm)

	Nº
max. 180 kg	2005292

[54] Handle → CTL_1

[59] Tilt stay set for floating-mullion installation

	Nº
Floating-mullion installation	482823

[60] Mounting screw

	Nº
Screw for installation on corner drive	567995

4.2.2 RC 1 N – centre closers



Fig. 4.5: Figure for timber profiles; PVC profiles available upon request



Application range

Without load transfer

SRW: 650 – 1600 mm

SRH: 600 – 2200 mm

S.kg: max. 100 kg

With load transfer

SRW: 650 – 1600 mm

SRH: 1000 – 2400 mm

S.kg: max. 150 kg

[2] Espagnolette – TSH 30, backset 25 mm

				Nº
25	800	1	P	616428

Optional

				Nº
20	800	1	P	611958
22	800	1	P	611959

[6] Centre lock, multipart

				Nº
200	Y	–	–	308267
400	Y	1	E	280346
600	Y	1	E	255282

Size-specific combinations:

				Nº
1001 – 1400	200 KU	–	–	308267
1401 – 1800	400 KU	1	E	280346
1801 – 2200	600 KU	1	E	255282

[11] Standard corner drive

		Nº
1	P	260277

[19] Multipart centre lock – standard, horizontal

				Nº
200	N	1	P	255284
400	N	1	P	255285
600	N	1	P	255286
600	Y	1	E	255282

Size-specific combinations:

top

				Nº
650 – 750	200	1	P	255284
751 – 950	400	1	P	255285
951 – 1150	600	1	P	255286
1151 – 1350	600 KU	1	E	255282
	200	1	P	255284
1351 – 1550	600 KU	1	E	255282
	400	1	P	255285
1551 – 1600	600 KU	1	E	255282
	600	1	P	255286

bottom

				Nº
650 – 850	400	1	P	255285
851 – 1050	600	1	P	255286
1051 – 1250	600 KU	1	E	255282
	200	1	P	255284
1251 – 1450	600 KU	1	E	255282
	400	1	P	255285
1451 – 1600	600 KU	1	E	255282
	600	1	P	255286

[23] Striker → from page 57

[24] Security striker → from page 58

[26] Centre closer, concealed, frame component

[27] Centre closer, concealed, sash component

[42] Rebate stay guide

		Nº
For Turn-Only sashes	220 / 15	2005701

[43] Rebate stay arm → from page 56

[44] Corner hinge

		Nº
12/18-13 12/20-13	Left	2005290
12/18-13 12/20-13	Right	2005291

[45] Pivot rest → from page 57

	Nº
max. 180 kg	2005292

[50] Load transfer sash component (SRW ≥ 600 mm, SRH ≥ 1000 mm)

	Nº
max. 180 kg	2005293

[51] Load transfer frame component (SRW ≥ 600 mm, SRH ≥ 1000 mm)

	Nº
max. 180 kg	2005292

[54] Handle → CTL_1

[59] Tilt stay set for floating-mullion installation

	Nº
Floating-mullion installation	482823

[60] Mounting screw

	Nº
Screw for installation on corner drive	567995

Optional

[82] Anti-jemmy device		
		Nº
13	From rebate depth 24 mm	792786



4.2.3 RC 1 N



Fig. 4.6: Figure for a PVC profile; use corresponding components for timber profiles.



Application range

Without load transfer

SRW: 650 – 1600 mm

SRH: 600 – 2200 mm

S.kg: max. 100 kg

With load transfer

SRW: 650 – 1750 mm

SRH: 1000 – 2400 mm

S.kg: max. 150 kg

[2] Espagnolette – TSH 30, backset 25 mm

				Nº
25	800	1	P	616428

Optional

				Nº
20	800	1	P	611958
22	800	1	P	611959

[6] Centre lock, multipart

				Nº
200	Y	–	–	308267
400	Y	1	E	280346
600	Y	1	E	255282

Size-specific combinations:

				Nº
1001 – 1400	200 KU	–	–	308267
1401 – 1800	400 KU	1	E	280346
1801 – 2200	600 KU	1	E	255282

[11] Standard corner drive

		Nº
1	P	260277

[14] Sash stay corner drive

		Nº
1	P	260286

[18] Multipart centre lock – standard, vertical

				Nº
400	N	1	E	255280
600	N	1	E	255281
600	Y	1	E	255282
200	N	1	P	255284

Size-specific combinations:

PVC

without load transfer

				Nº
801 – 1200	400	1	E	255280
1201 – 1400	600	1	E	255281
1401 – 1800	600 KU	1	E	255282
	400	1	E	255280

				Nº
1801 – 2000	600 KU	1	E	255282
	600	1	E	255281
2001 – 2400	600 KU	1	E	255282
	600 KU	1	E	255282
	400	1	E	255280

With load transfer

				Nº
1001 – 1200	400	1	E	255280
1201 – 1400	600	1	E	255281
1401 – 1600	600 KU	1	E	255282
	200	1	P	255284
1601 – 1800	600 KU	1	E	255282
	400	1	E	255280
1801 – 2000	600 KU	1	E	255282
	600	1	E	255281
2001 – 2200	600 KU	1	E	255282
	600 KU	1	E	255282
	200	1	P	255284
2201 – 2400	600 KU	1	E	255282
	600 KU	1	E	255282
	400	1	E	255280

Timber

without load transfer

				Nº
1101 – 1800	600	1	E	255281
1801 – 2400	600 KU	1	E	255282
	600	1	E	255281

With load transfer

				Nº
1101 – 1150	400	1	E	255280
1151 – 1800	600	1	E	255281
1801 – 2400	600 KU	1	E	255282
	600	1	E	255281

[19] Multipart centre lock – standard, horizontal

				Nº
200	N	1	P	255284
400	N	1	P	255285
600	N	1	P	255286
600	Y	1	E	255282

Size-specific combinations:

				Nº
650 – 850	400	1	P	255285
851 – 1050	600	1	P	255286
1051 – 1250	600 KU	1	E	255282
	200	1	P	255284

				Nº
1251 – 1450	600 KU	1	E	255282
	400	1	P	255285
1451 – 1600	600 KU	1	E	255282
	600	1	P	255286

[23] Striker → from page 57**[24] Security striker → from page 58****[36] Stay guide – basic security**

					Nº
601 – 800	350	690	–	–	2005272
801 – 1000	500	890	1	E	2005273
1001 – 1200	500	1090	1	E	2005274
1201 – 1400	500	1290	1	E	2005275

[38] Stay arm → from page 54**[44] Corner hinge**

		Nº
12/18-13 12/20-13	Left	2005290
12/18-13 12/20-13	Right	2005291

[45] Pivot rest → from page 57

	Nº
max. 180 kg	2005292

[49] Packer → from page 62**[50] Load transfer sash component**
(SRW ≥ 600 mm, SRH ≥ 1000 mm)

	Nº
max. 180 kg	2005293

[51] Load transfer frame component
(SRW ≥ 600 mm, SRH ≥ 1000 mm)

	Nº
max. 180 kg	2005292

[54] Handle → CTL_1**[59] Tilt stay set for floating-mullion installation**

	Nº
Floating-mullion installation	482823

[60] Mounting screw

	Nº
Screw for installation on corner drive	567995

Optional**[82] Anti-jemmy device**

Nº

13

From rebate depth 24 mm

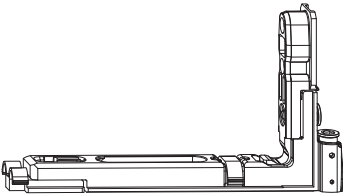
792786



5 Frame and sash components

5.1 Corner hinges

5.1.1 Hinge side C (HA 13)



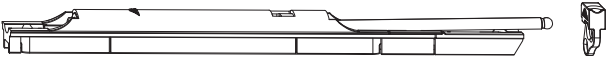
				Nº
12/18-13 12/20-13	12 mm	Roto Sil	Left	2005290
12/18-13 12/20-13		Roto Sil	Right	2005291

For compatible pivot rests, see → from page 57

For compatible load transfer, see → from page 53

5.2 Load transfer

5.2.1 Hinge side C (HA 13)

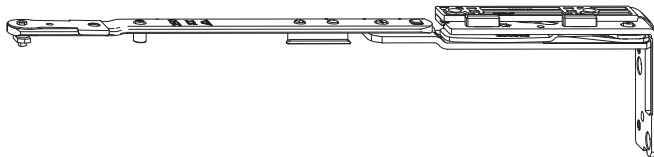


			Nº
Frame component	max. 180 kg	Roto Sil	2005292
Sash component	max. 180 kg	Roto Sil	2005293

5.3 PVC

5.3.1 Stay arm

5.3.1.1 Standard – stay arm 250

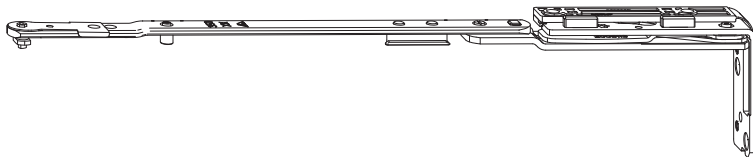


				Nº
Rehau S969 Synego	250	Roto Sil	Left	2008560
Rehau S980 Geneo	250	Roto Sil	Right	2008561
Rehau S986 EuroDesign 86				
Rehau Total70R Reversible window				
KBE 70 AD	250	Roto Sil	Left	2008572
Kömmerring 76	250	Roto Sil	Right	2008573
Kömmerring C70 Gold				
Trocal 76				
Profine 76				
Profine 88				
Brüggmann AD 13	250	Roto Sil	Left	2008590
Brüggmann MD 13	250	Roto Sil	Right	2008591
LB Profile Pad				
Salamander BluEvolution 73				
Salamander BluEvolution 82				
Salamander GreenEvolution 76				
Veka Alphaline 90				
Veka Softline 70 MD				
Veka Softline 76 AD				
Veka Softline 76 MD				
Veka Softline 82 AD				
Veka Softline 82 MD				
Veka Topline AD 13				
Veka M70				
Veka Topline MD 13				
Rehau Artevo	250	Roto Sil	Left	2036876
	250	Roto Sil	Right	2036880

For more profile systems, see CTL_105.



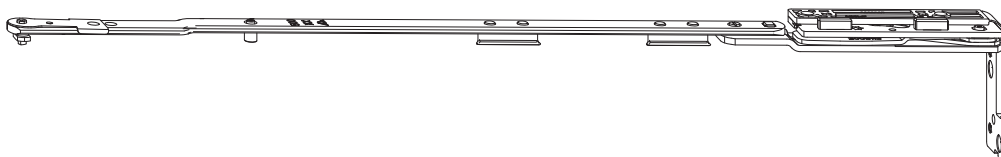
5.3.1.2 Standard – stay arm 350



				Nº
Rehau S969 Synego	350	Roto Sil	Left	2008562
Rehau S980 Geneo	350	Roto Sil	Right	2008563
Rehau S986 EuroDesign 86				
Rehau Total70R Reversible window				
KBE 70 AD	350	Roto Sil	Left	2008574
Kömmerling 76	350	Roto Sil	Right	2008575
Kömmerling C70 Gold				
Trocal 76				
Profine 76				
Profine 88				
Brüggmann AD 13	350	Roto Sil	Left	2008592
Brüggmann MD 13	350	Roto Sil	Right	2008593
LB Profile Pad				
Salamander BluEvolution 73				
Salamander BluEvolution 82				
Salamander GreenEvolution 76				
Veka Alphaline 90				
Veka Softline 70 AD				
Veka Softline 70 MD				
Veka Softline 76 AD				
Veka Softline 76 MD				
Veka Softline 82 MD				
Veka Topline AD 13				
Veka M70				
Veka Topline MD 13				
Rehau Artevo	350	Roto Sil	Left	2036881
	350	Roto Sil	Right	2036882

For more profile systems, see CTL_105.

5.3.1.3 Standard – stay arm 500



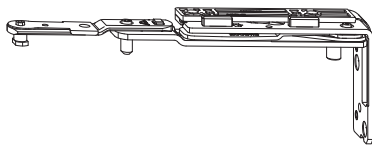
				Nº
Rehau S969 Synego	500	Roto Sil	Left	2008564
Rehau S980 Geneo	500	Roto Sil	Right	2008565
Rehau S986 EuroDesign 86				
Rehau Total70R Reversible window				
KBE 70 AD	500	Roto Sil	Left	2008576
Kömmerling 76	500	Roto Sil	Right	2008577
Kömmerling C70 Gold				
Trocal 76				
Profine 76				
Profine 88				

				Nº
Brüggmann AD 13	500	Roto Sil	Left	2008594
Brüggmann MD 13	500	Roto Sil	Right	2008595
LB Profile Pad				
Salamander BluEvolution 73				
Salamander BluEvolution 82				
Salamander GreenEvolution 76				
Veka Alphaline 90				
Veka Softline 70 AD				
Veka Softline 70 MD				
Veka Softline 76 AD				
Veka Softline 76 MD				
Veka Softline 82 MD				
Veka Topline AD 13				
Veka M70				
Veka Topline MD 13				
Rehau Artevo	500	Roto Sil	Left	2036883
	500	Roto Sil	Right	2036884

For more profile systems, see CTL_105.

5.3.2 Rebate stay arm

5.3.2.1 Standard



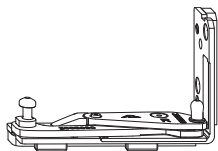
			Nº
Rehau S969 Synego	Roto Sil	Left	2008807
Rehau S980 Geneo	Roto Sil	Right	2008808
Rehau S986 EuroDesign 86			
Rehau Total70R Reversible window			
KBE 70 AD	Roto Sil	Left	2008811
Kömmerling 76	Roto Sil	Right	2008812
Kömmerling C70 Gold			
Trocal 76			
Profine 76			
Profine 88			
Brüggmann AD 13	Roto Sil	Left	2008817
Brüggmann MD 13	Roto Sil	Right	2008818
LB Profile Pad			
Salamander BluEvolution 73			
Salamander BluEvolution 82			
Salamander GreenEvolution 76			
Veka Alphaline 90			
Veka Softline 70 MD			
Veka Softline 76 AD			
Veka Softline 76 MD			
Veka Softline 82 AD			
Veka Softline 82 MD			
Veka Topline AD 13			
Veka M70			
Veka Topline MD 13			
Rehau Artevo	Roto Sil	Left	2036891
	Roto Sil	Right	2036892

For more profile systems, see CTL_105.



5.3.3 Pivot rests

5.3.3.1 Standard

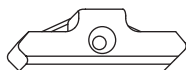


			Nº
Rehau S969 Synego Rehau S980 Geneo Rehau S986 EuroDesign 86 Rehau Total70R Reversible window	Roto Sil	Left	2008877
	Roto Sil	Right	2008878
	Roto Sil	Left	2008881
	Roto Sil	Right	2008882
KBE 70 AD Kömmerling 76 Kömmerling C70 Gold Trocal 76 Profine 76 Profine 88	Roto Sil	Left	2008887
	Roto Sil	Right	2008888
	Roto Sil	Left	2036895
	Roto Sil	Right	2036896
Brüggmann AD 13 Brüggmann MD 13 LB Profile Pad Salamander BluEvolution 73 Salamander BluEvolution 82 Salamander GreenEvolution 76 Veka Alphaline 90 Veka Softline 70 MD Veka Softline 76 AD Veka Softline 76 MD Veka Softline 82 AD Veka Softline 82 MD Veka Topline AD 13 Veka M70 Veka Topline MD 13	Roto Sil	Left	2008887
	Roto Sil	Right	2008888
	Roto Sil	Left	2036895
	Roto Sil	Right	2036896

For more profile systems, see CTL_105.

5.3.4 Strikers

5.3.4.1 Standard

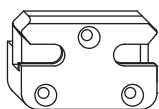
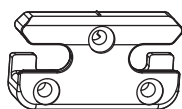


				Nº
KBE 76 Kömmerling 76 Trocal 76 KBE 88 MD Kömmerling 88 MD Panorama 3000 Kömmerling C70 Gold Trocal 88 MD	13	N	Roto Sil	738470

				Nº
Rehau S735 MD Rehau S788 Rehau S799 Brillant Design Rehau S969 Synego Rehau S980 Geneo Rehau S986 EuroDesign 86 Rehau Total70R Reversible window	13	N	Roto Sil	332439
Salamander BluEvolution 82 Schüco CT70 AD Veka Alphaline 90 Veka Softline 70 AD Veka Softline 70 MD Veka Topline AD 13 Veka Topline MD 13 Salamander BluEvolution 73 Veka Softline 82 MD Veka Softline 76 AD Veka Softline 76 MD Veka M70	13	N	Roto Sil	332438

**INFO**

Other versions are available upon request.

5.3.4.2 Security**Zinc****A****B**

Assignment	Meaning	Security
[A]	With base	RC 1 N, RC 2 / RC 2 N
[B]	Without base	Basic security

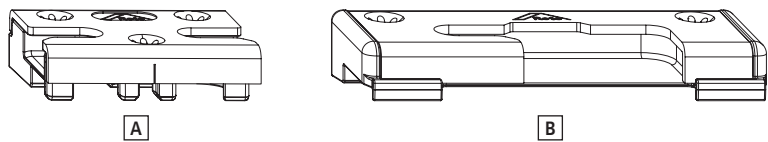
			Nº
KBE 76 Kömmerring 76 Trocal 76 KBE 88 MD Kömmerring 88 MD Kömmerring C70 Gold Trocal 88 MD	13	Y	738471
Rehau S735 MD Rehau S788 Rehau S799 Brillant Design Rehau S969 Synego Rehau S986 EuroDesign 86 Rehau Total70R Reversible window	13	Y	316942
Salamander BluEvolution 82 Schüco CT70 AD Veka Alphaline 90 Veka Softline 70 AD Veka Softline 70 MD Veka Topline AD 13 Veka Topline MD 13 Salamander BluEvolution 73 Veka Softline 76 AD Veka Softline 76 MD Veka M70	13	N	348410



INFO

Other versions are available upon request.

Steel



Assignment	Meaning
[A]	Striker, symmetrical
[B]	Striker, right / left

				Nº
KBE 76 KBE 88 MD Kömmerling 76 Kömmerling 88 MD Kömmerling C70 Gold Trocal 76 Trocal 88 MD	13	Y	Roto Sil	856754
Rehau S735 MD Rehau S788 Rehau S799 Brillant Design Rehau S969 Synego Rehau S980 Geneo Rehau S986 EuroDesign 86 Rehau Total70R Reversible window	13	Y	Roto Sil	856748
Salamander BluEvolution 73 Salamander BluEvolution 82 Schüco CT70 AD Veka Alphaline 90 Veka Softline 70 AD Veka Softline 76 AD Veka Softline 76 MD Veka Softline 82 MD Veka Topline AD 13 Veka M70 Veka Topline MD 13	13	Y	Roto Sil	856738

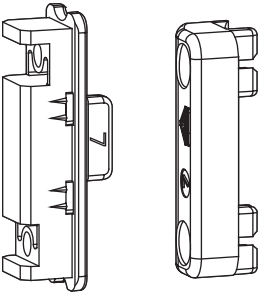


INFO

Other versions are available upon request.

5.3.5 Centre closer

5.3.5.1 Concealed

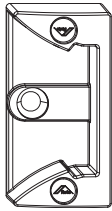


			Nº
Sash	–	No. 14	331485
Frame	Rehau S799 Brillant Design Rehau S980 Geneo Rehau S986 EuroDesign 86 Rehau Total70R Reversible window	No. 14	250725
	KBE 76 Kömmerring 76 Roplasto 4K Roplasto 7001 AD Roplasto 7001 MD Trocal 76 Kömmerring C70 Gold	No. 14	264249
	Schüco CT70 AD Veka Alphaline 90 Veka Topline AD 13 Veka Softline 76 AD Veka Softline 76 MD Veka M70	No. 14	250728
Sash	–	No. 7	313087
Frame	Rehau Artevo	No. 7	390623



5.3.6 Bullet catch

Standard



			Nº
<p>Aluplast Ideal 2000 Aluplast energeto 5000 Aluplast energeto 5000 view Aluplast energeto 7000 Aluplast Ideal 4000 Aluplast Ideal 5000 Aluplast energeto 8000 Aluplast Ideal 7000 Aluplast Ideal 8000 Rehau S735 MD Rehau S788 Rehau S799 Brillant Design Rehau S969 Synego Rehau S980 Geneo Rehau S986 EuroDesign 86 Salamander 2D Salamander 3D Salamander Streamline 76 Schüco Corona AD Schüco CT70 AD Schüco LivIng 82 Rehau Total70R Reversible window</p>	13	Roto Sil	788572
<p>Salamander BluEvolution 73 Salamander BluEvolution 82 KBE 70 AD KBE 76 KBE 88 MD Kömmerling 76 Kömmerling 88 Plus Kömmerling 88 MD Kömmerling Eurodur 3S Kömmerling Eurofutur Classic Kömmerling Eurofutur Elegance Plus Plan Plus Tec Roplasto 4K Roplasto 7001 AD Roplasto 7001 MD Trocacal 76 Trocacal 88 MD Veka Softline 70 AD Veka Softline 70 MD Salamander GreenEvolution 76 Veka Topline AD 13 Veka Topline MD 13 Veka Softline 76 AD Veka Softline 76 MD Veka M70</p>	13	Roto Sil	788615

5.3.7 Packers



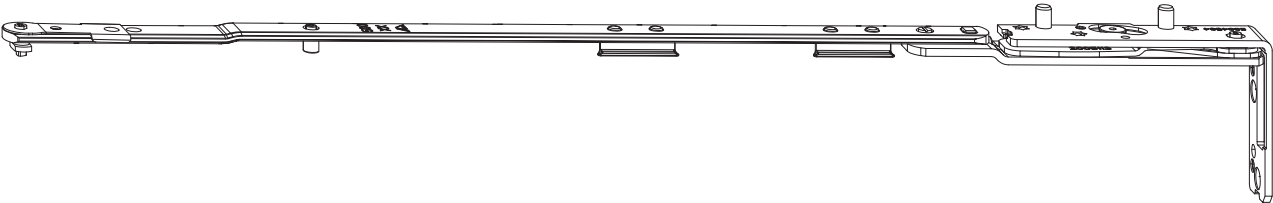
 Frame		Nº
	Aluplast Ideal 2000 Brügmann AD 13 Salamander BluEvolution 82 Schüco CT70 AD Schüco CT70 MD Schüco SI82 MD Trocal InnoNova 70.A5 AD Trocal InnoNova 70.M5 MD Veka Topline AD 13 Veka Topline MD 13 Salamander BluEvolution 73 Salamander GreenEvolution 76 Veka M70	294364
	Deceuninck Zendow Rehau S735 MD Rehau S788 Rehau S799 Brillant Design Rehau S980 Geneo Roplasto 4K Roplasto 7001 AD Roplasto 7001 MD Deceuninck Elegant Deceuninck Legend Rehau Total70R Reversible window	294469
	Gealan S3000 Gealan S7000 Gealan S8000 KBE 76 Kömmerling 76 Trocal 76 KBE 88 MD Kömmerling 88 MD Kömmerling C70 Gold Trocal 88 MD	294370



5.4 Timber

5.4.1 Stay arm

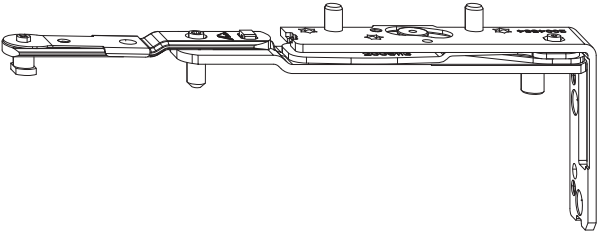
5.4.1.1 Standard



							Nº
12/18-13 12/20-13 12/22-13	340 – 600	250	24	12	Roto Sil	Left	2005202
				12	Roto Sil	Right	2005203
			30	12	Roto Sil	Left	2008542
				12	Roto Sil	Right	2008543
	601 – 800	350	24	12	Roto Sil	Left	2005249
				12	Roto Sil	Right	2005250
			30	12	Roto Sil	Left	2008544
				12	Roto Sil	Right	2008545
	801 – 1750	500	24	12	Roto Sil	Left	2005251
				12	Roto Sil	Right	2005252
			30	12	Roto Sil	Left	2008546
				12	Roto Sil	Right	2008547

5.4.2 Rebate stay arm

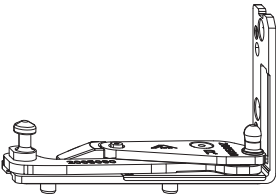
5.4.2.1 Standard



					Nº
12/18-13 12/20-13 12/22-13	24	12	Roto Sil	Left	2005282
		12	Roto Sil	Right	2005283
	30	12	Roto Sil	Left	2008801
		12	Roto Sil	Right	2008802

5.4.3 Pivot rests

5.4.3.1 Standard



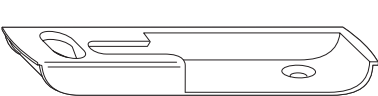
						Nº
NT Designo pivot rest (HA 13)	24	12	max. 180 kg	Roto Sil	Left	2005286
		12	max. 180 kg	Roto Sil	Right	2005287
	30	12	max. 180 kg	Roto Sil	Left	2008871
		12	max. 180 kg	Roto Sil	Right	2008872

For compatible corner hinges, see → *from page 53*

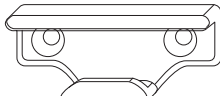
For compatible load transfer, see → *from page 53*

5.4.4 Strikers

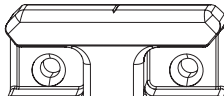
5.4.4.1 Standard



A



B



C

Assignment	Meaning
[A]	Can be routed in
[B]	Hardware axis 13 (Euro-rebate / Euro-groove)



Assignment		Meaning									
[C]		Hardware axis 13 (Euro-rebate, reinforced version)									
											Nº
–	25	5	Can be routed in	N	–	–	13	Y	Roto Sil	Left	627988
–		5	Can be routed in	N	–	–	13	Y	Roto Sil	Right	627990
Eurofalz	24	12	Screw-on	N	–	–	13	Y	Roto Sil	–	261933
Eurofalz		12	Screw-on	Y	2 x Ø 8 mm	–	13	Y	Roto Sil	–	261934
Eurofalz		12	Screw-on	N	–	Reinforced version	13	Y	Roto Sil	–	532873
Eurofalz		12	Screw-on	Y	2 x Ø 8 mm	Reinforced version	13	Y	Roto Sil	–	624076
Eurofalz	30	12	Screw-on	N	–	–	13	N	Roto Sil	–	599651
Eurofalz		12	Screw-on	Y	2 x Ø 8 mm	–	13	N	Roto Sil	–	599652
Euronut 11/8	24	12	Screw-on	N	–	–	13	Y	Roto Sil	–	378467



INFO

Reinforced version, not compatible with existing jig system.

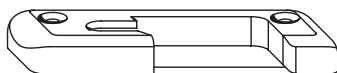


INFO

Other versions are available upon request.

5.4.4.2 Security

Zinc



A



B

Assignment		Meaning									
[A]		Striker, right / left									
[B]		Striker, symmetrical									

[B] Symmetrical striker can only be used from a rebate depth of 30.

										Nº
–	25	5	Can be routed in	N	–	13	Y	Roto Sil	Left	627988
		5	Can be routed in	N	–	13	Y	Roto Sil	Right	627990
Eurofalz	24	12	Screw-on	N	–	13	Y	Roto Sil	Left	261935
		12	Screw-on	N	–	13	Y	Roto Sil	Right	262930
		12	Screw-on	Y	2 x Ø 8 mm	13	Y	Roto Sil	Left	261936
		12	Screw-on	Y	2 x Ø 8 mm	13	Y	Roto Sil	Right	262931
	30	12	Screw-on	N	–	13	Y	Roto Sil	–	631527
Euronut 11/8	24	12	Screw-on	N	–	13	Y	Roto Sil	Left	378465
		12	Screw-on	N	–	13	Y	Roto Sil	Right	378466



INFO

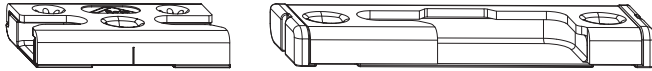
Other versions are available upon request.

Frame and sash components

Timber

Centre closers

Steel



										Nº
Eurofalz	24	12	Screw-on	N	–	13	Y	Roto Sil	Left	856999
		12	Screw-on	N	–	13	Y	Roto Sil	Right	856998
		12	Screw-on	Y	2 x Ø 8 mm	13	Y	Roto Sil	Left	856996
		12	Screw-on	Y	2 x Ø 8 mm	13	Y	Roto Sil	Right	856997
	30	12	Screw-on	N	–	13	Y	Roto Sil	–	856746
		12	Screw-on	Y	2 x Ø 8 mm	13	Y	Roto Sil	–	838711



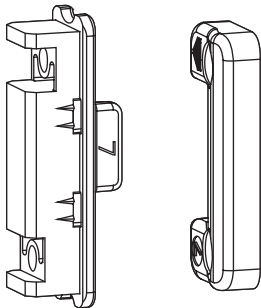
INFO

Other versions are available upon request.

5.4.5 Centre closers

5.4.5.1 Concealed

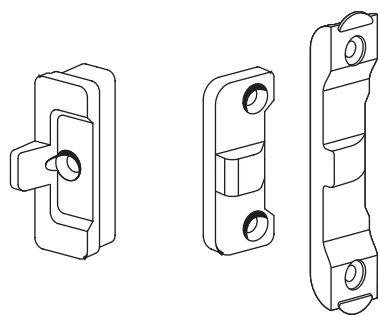
Adjustable



									Nº
Sash	–	–	–	Screw-on	–	–	Height adjustable	No. 07	450984
Frame	Eurofalz	30	12	Screw-on	N	–	–	No. 07	578787
			12	Screw-on	Y	2 x Ø 8 mm	–	No. 07	578788

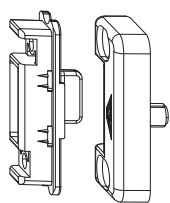


Not adjustable



								Nº
Sash	–	–	–	Screw-on	–	–	No. 02	331486
Frame	–	24	5	Can be routed in	N	–		355616
	Eurofalz	24	12	Screw-on	N	–		261951
		24	12	Screw-on	Y	2 x Ø 8 mm		261952

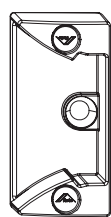
For RC 1 N



							Nº
Sash	–	–	–	–	–	–	313087
Frame	Eurofalz	24	12	Screw-on	Y	1 x Ø 6 mm	2033329

5.4.6 Bullet catches

5.4.6.1 Frame components



								Nº
–	24	4	Can be routed in	N	–	13	Roto Sil	788377
Eurofalz		12	Screw-on	N	–	13	Roto Sil	788367
		12	Screw-on	Y	2 x Ø 8 mm	13	Roto Sil	788371
		12	Screw-on	N	–	13	Roto Sil	788368
		12	Screw-on	Y	2 x Ø 8 mm	13	Roto Sil	788372

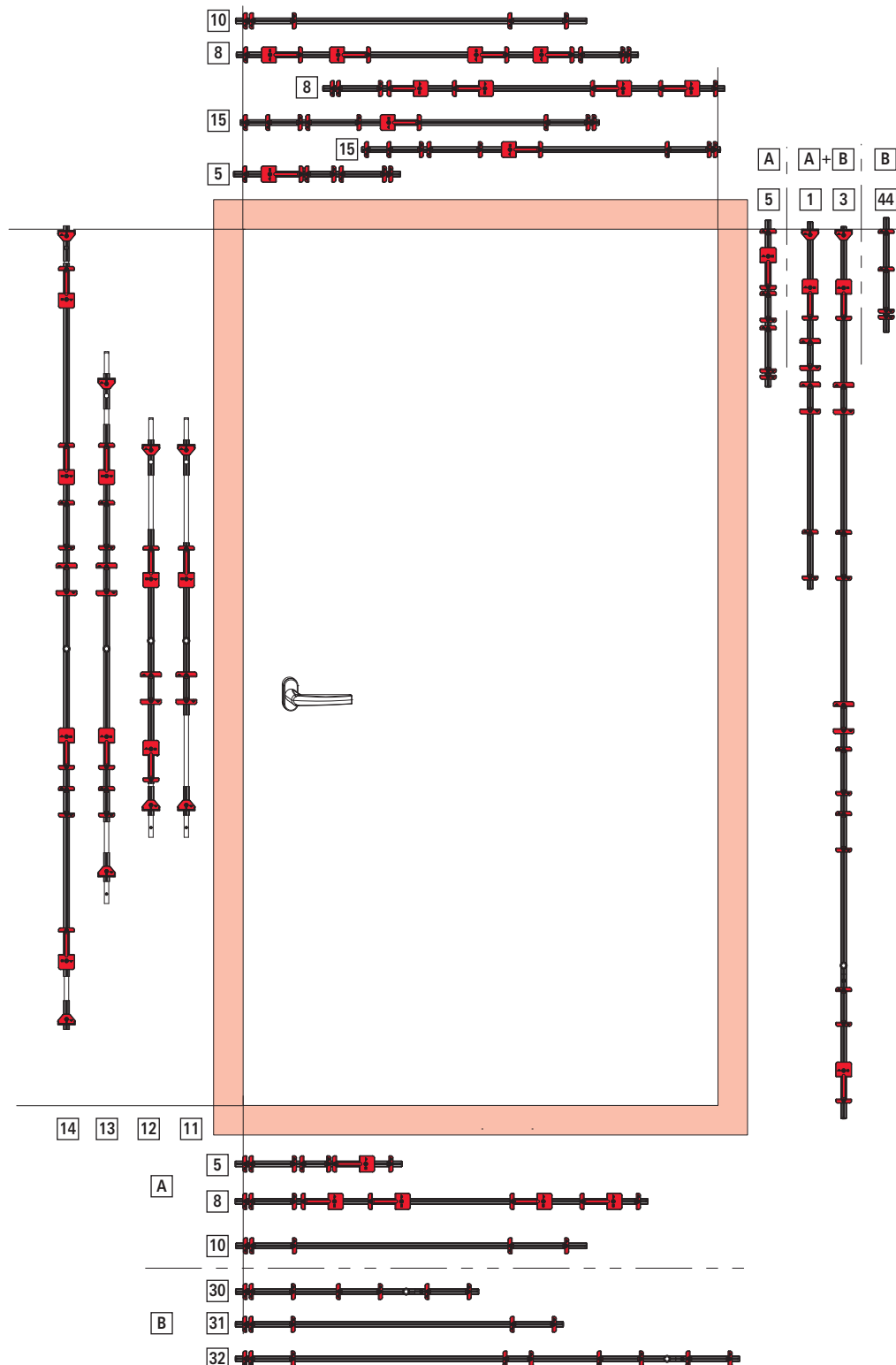
6 Jigs

6.1 Positioning jigs

6.1.1 T&T espagnolette – centred / variable handle height

The figure shows positioning jigs for short strikers (50 mm).

Turn the jigs for long strikers.





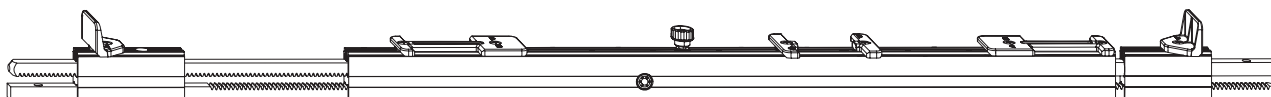
[A] BSec

[B] RC 1 N

Item	Assignment	Application range	T&T		T-O	Single jig
			BSec	RC 1 N	BSec	
Espagnolette side	[11]	SRH 621 – 1200	■	■	■	Standard
	[12]	SRH 1201 – 1600	■	■	■	
	[13]	SRH 1601 – 2000	■	■	■	
	[14]	SRH 2001 – 2400	■	■	■	
Hinge side	[5]	SRH 315 – 1100	■	■	–	Tilt striker / corner drive
	[7]	SRH 1101 – 1800	■	■	–	Standard
	[3]	SRH 1801 – 2800	■	■	■	
	[44]*	SRH 320 – 2800	–	■	–	
Horizontal at the top	[5]	SRW 340 – 1750	■	■	■	Tilt striker / corner drive
	[8]	BSec: SRW 1001 – 1750 RC 1 N: SRW 1001 – 1600	■	■	–	Centre lock → <i>from page 70</i>
	[15]	SRW 801 – 1000	■	■	–	Turn-Only sash
	[10]	SRW 1101 – 1600	–	–	■	
Horizontal at the bottom	[5]	SRW 340 – 1100	■	–	■	Tilt striker / corner drive
	[8]	SRW 1101 – 1750	■	–	■	Centre lock
	[10]	SRW 1101 – 1600	–	–	■	Turn-Only sash
	[30]	SRW 450 – 1050	–	■	–	RC 1 N centre lock → <i>from page 70</i>
	[31]	SRW 851 – 1250	–	■	–	
	[32]	SRW 1251 – 1600	–	■	–	

* Is used for the top locking point only.

6.1.1.1 Standard



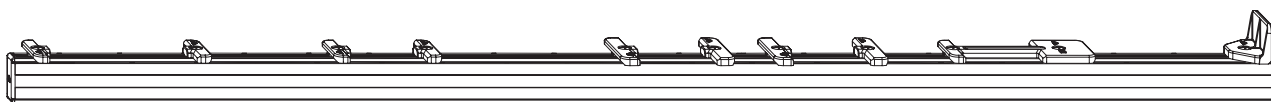
Espagnolette side

						Nº
Standard	Basic security RC 1 N	621 – 1200	Espagnolette side	No. 11	268943	
Standard	Basic security RC 1 N	1001 – 1600	Espagnolette side	No. 12	798480	
Standard	Basic security RC 1 N	1601 – 2000	Espagnolette side	No. 13	787401	
Standard	Basic security RC 1 N	2001 – 2400	Espagnolette side	No. 14	787402	

Jigs

Positioning jigs

T&T espagnolette – centred / variable handle height



Hinge side

					Nº
Tilt striker / corner drive	RC 1 N	320 – 2600	Hinge side	No. 44	640450
Standard	Basic security RC 1 N	801 – 1600	Espagnolette side Hinge side	No. 7	290074
	Basic security RC 1 N	1601 – 2600	Espagnolette side Hinge side	No. 3	290050



INFO

With T&T espagnolettes – centred / variable handle height, use jigs on the hinge side only.

6.1.1.2 Tilt striker / corner drive



					Nº
Tilt striker / corner drive	315 – 1100	315 – 1200	Top Bottom Hinge side	No. 5	290072

6.1.1.3 Centre lock



					Nº
Centre lock	Basic security RC 1 N	1201 – 1600	Top Bottom	No. 8	290075
		400 – 800	Bottom	No. 30	268931
	RC 1 N	801 – 1000	Bottom	No. 31	268932
		1001 – 1400	Bottom	No. 32	268933

6.1.1.4 Turn-Only sash



				Nº
Turn-Only sash	1101 – 1600	Top Bottom	No. 10	290081



7 Installation

7.1 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.

Turn-Only windows, outward opening

- Except for on the ground floor, floor-to-ceiling elements are only permitted if additional protection is provided, e.g. railings. Should this not be the case, the barrier must be at least 90 cm tall.
Refer to the relevant state building regulations for the fall heights above which protection is required.
- Protection must be ensured over the entire life cycle of the element. Durability must be ensured through suitable maintenance and repair measures.
- Tilt stays
 - Tilt stays are not a security component in accordance with DIN EN 13126-5.
 - Tilt stays do not prevent falls.
 - Tilt stays do not have a braking effect. The sash can fall shut due to the force of the wind.
 - Tilt stays need to be unhinged, e.g. for adjustment. This work can only be carried out from the outside (e.g. facade lift).

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.

7.2 Screw fixing

Electrogalvanised and passivated steel fenestration screws ($\varnothing$ 3.9 – 4.2 x ...) are to be used to fasten the hardware components; in more challenging climatic conditions, use fenestration screws with additional sealing.

When attaching security-relevant, load-bearing hardware components (hinge sides), the manufacturer of windows and balcony doors must prove the specified forces in accordance with the table below (excerpt from Directive TBDK issued by the Gütegemeinschaft Schlösser und Beschläge e. V. quality assurance association) by means of testing and ensure them on their product.



INFO

Observe directive TBDK for tractive force values as a function of the sash weights.

Further information can be found at www.guetegemeinschaft-schloss-beschlag.de.

The spacer block guidelines for glazing methods must be complied with.

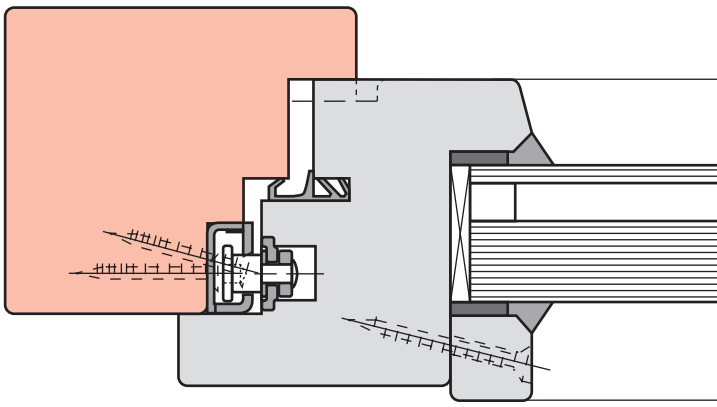
7.3 Mounting suggestion for security windows

Fastening the SEC striker

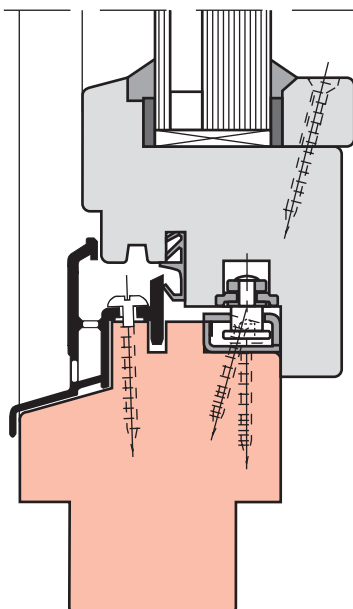
3 pcs screws 4 x ...

Glazing bead mounting

With screws if required.



Horizontal cross section





Vertical cross section

7.4 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

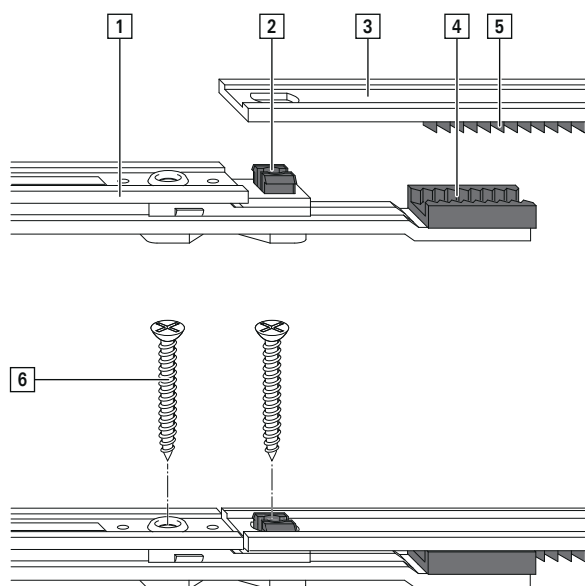
Improper screw fixings may cause property damage.

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.

7.5 Force-fit connection

Couplable hardware components always require a force-fit connection.



Assignment	Description
[1]	Component A
[2]	Screw guide with clamp
[3]	Component B
[4]	Component A toothed segment
[5]	Component B toothed segment
[6]	Screw

Force-fit connections are formed by screwing down components A and B so that forces and movements are transferred without loss.



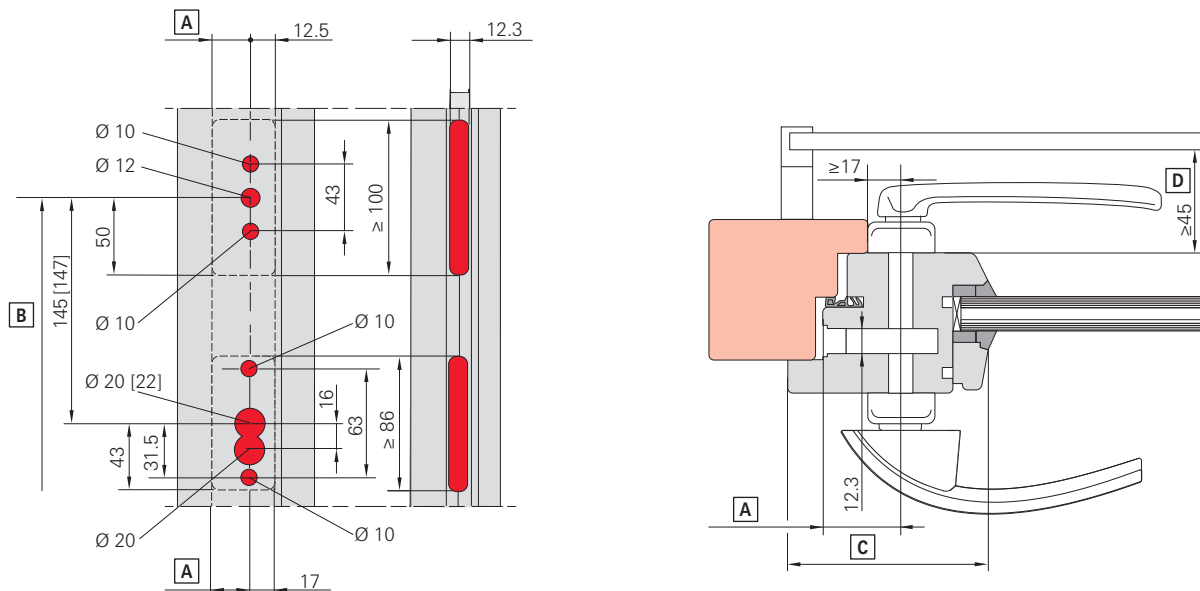
INFO

All couplable components are delivered attached in the centre.



7.6 Drilling and routing dimensions

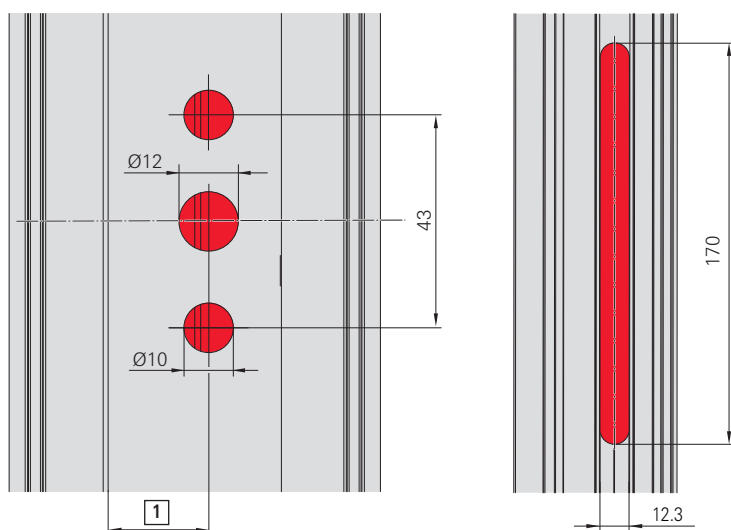
7.6.1 T&T espagnolette BS ≥ 25



Values in brackets apply to round cylinders.

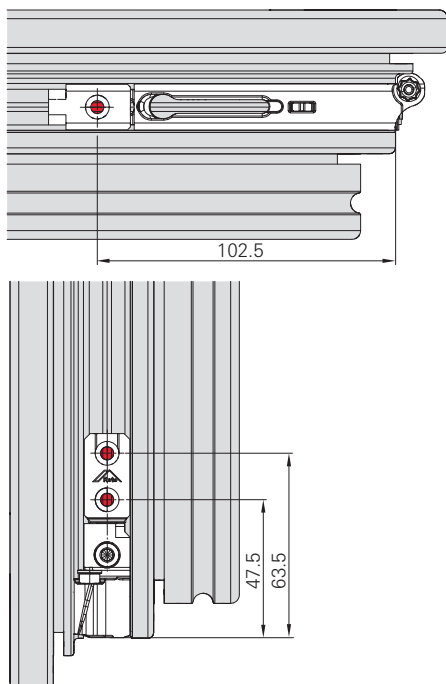
Assignment	Meaning	Profile width	Backset
[A]	Backset		–
[B]	Handle height		–
[C]	–	82 mm	25 mm
	–	87 mm	30 mm
	–	92 mm	35 mm
	–	97 mm	40 mm
	–	102 mm	45 mm
	–	107 mm	50 mm
[D]	On roller shutters		–

7.6.2 TSH 30

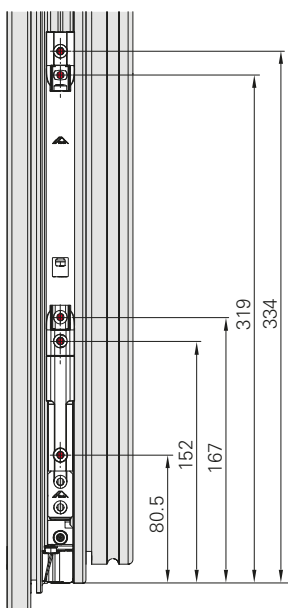


[1] Backset

7.6.3 Corner hinge



7.6.4 Load transfer

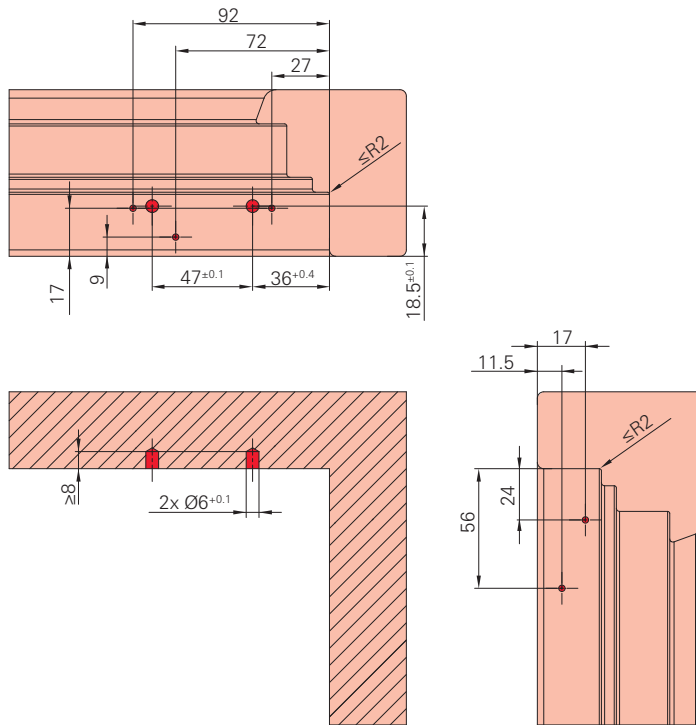




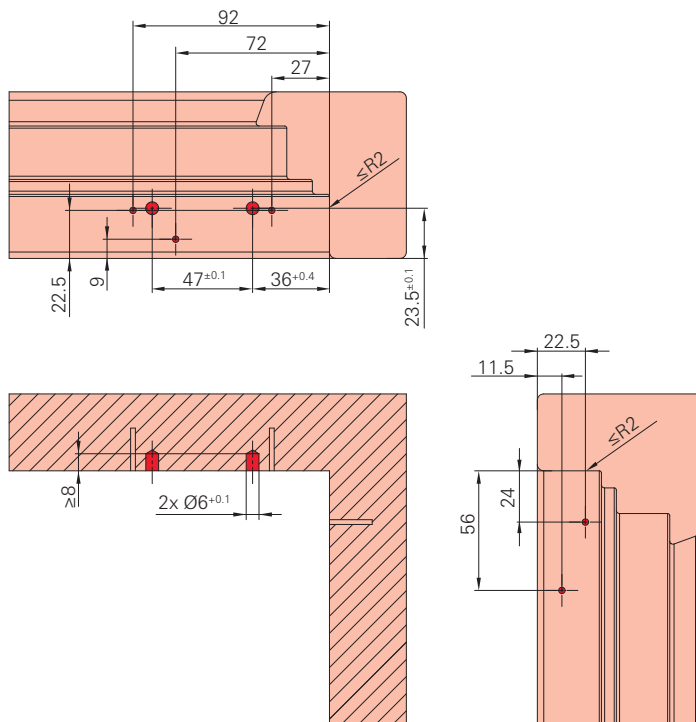
7.6.5 Timber

7.6.5.1 Sash stay / rebate sash stay

Rebate depth 24

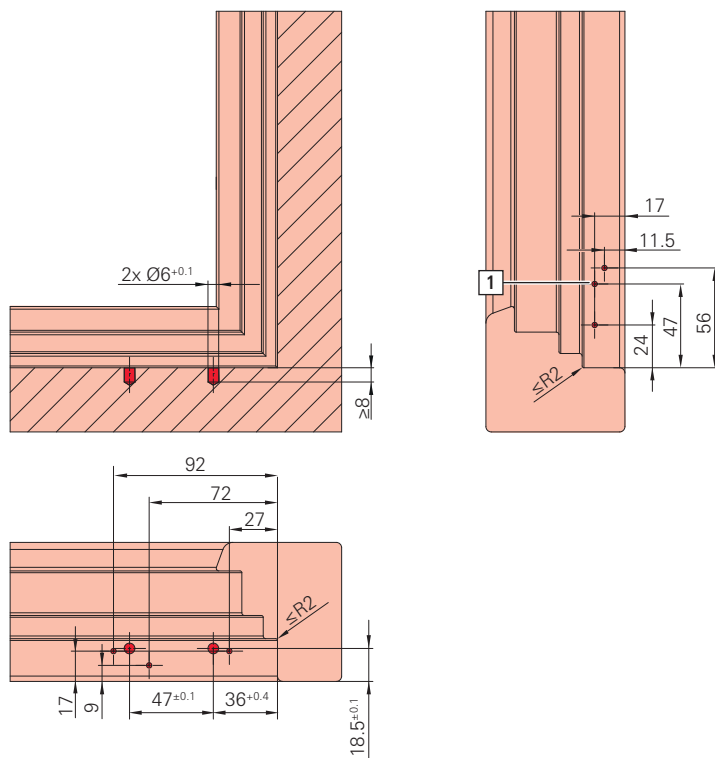


Rebate depth 30



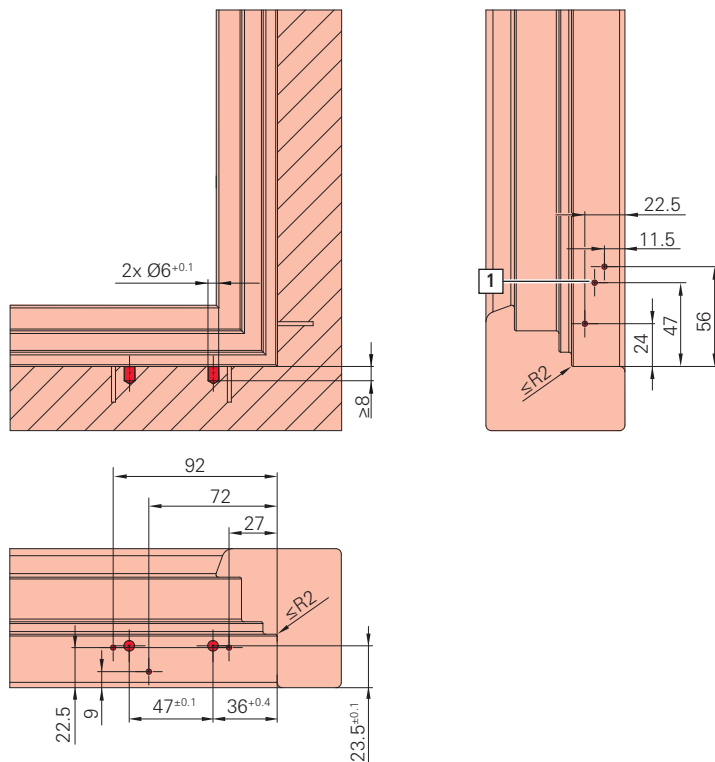
7.6.5.2 Pivot rest

Rebate depth 24



[1] For load transfer

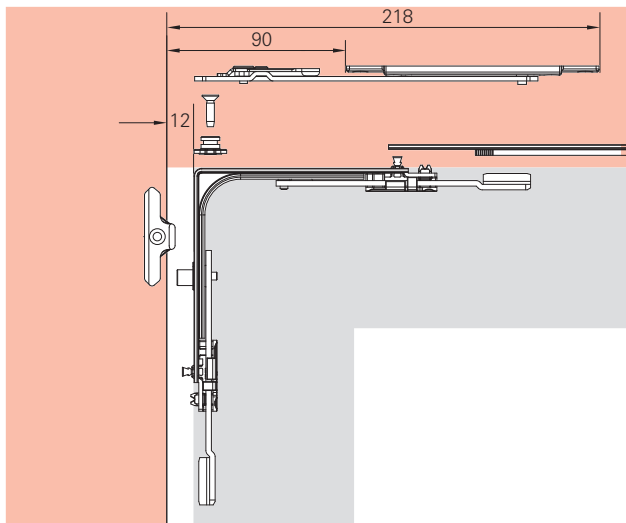
Rebate depth 30



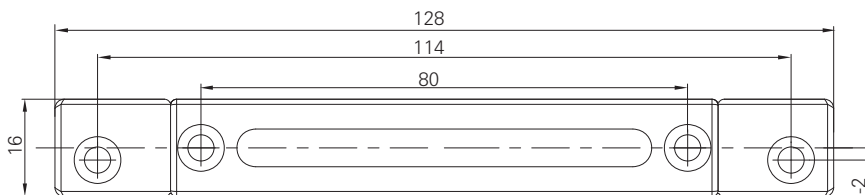
[1] For load transfer



7.6.5.3 Tilt stay

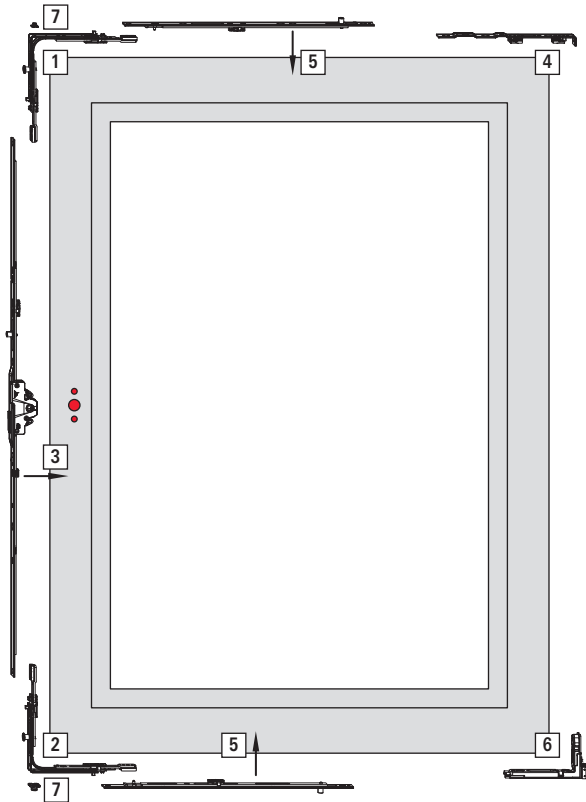


Frame component dimensions



7.7 Sash

7.7.1 Installation sequence



- [1] Corner drive, standard
- [2] Corner drive, standard
- [3] Espagnolette
- [4] Stay guide
- [5] Centre lock, horizontal
- [6] Corner hinge
- [7] Tilt stay sash component

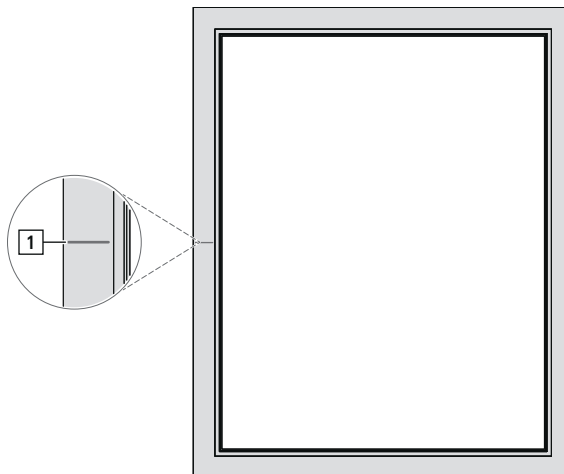


7.7.2 Preparing the sash for the T&T espagnolette

7.7.2.1 Handle drill holes

Drilling the holes for the handle

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



2. Drill holes.
Note any different drilling dimensions. → 7.6
"Drilling and routing dimensions" from page 75
3. Deburr the drill holes.

7.7.2.2 Gearbox cutout

Routing the gearbox cutout

1. Route the espagnolette cutout.
Observe the routing dimensions. → 7.6 "Drilling and routing dimensions" from page 75
2. Deburr the espagnolette cutout.

7.7.2.3 Gearbox cutout with lock casing

Routing the gearbox cutout with lock casing

1. Route the espagnolette cutout.
Observe the routing dimensions. → 7.6 "Drilling and routing dimensions" from page 75
2. Deburr the espagnolette cutout.

7.7.3 Cropping the hardware components



ATTENTION

Incorrect cropping methods may result in property damage.

If the hardware components are inserted into the sash too early, the screw guide will engage and will be destroyed when removed.

- Only lay out the hardware components and do not insert them into the sash before they have been cropped.

Installation

Sash

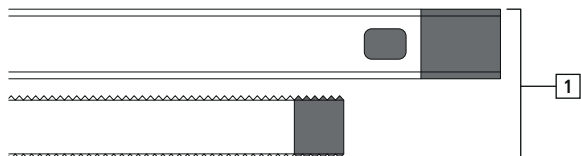
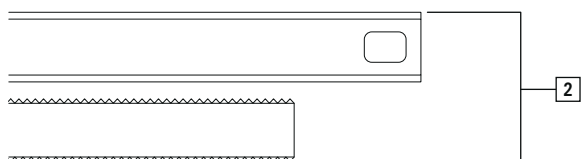
Cropping the hardware components

The following hardware components are cropped:

- Espagnolette
- Stay guide

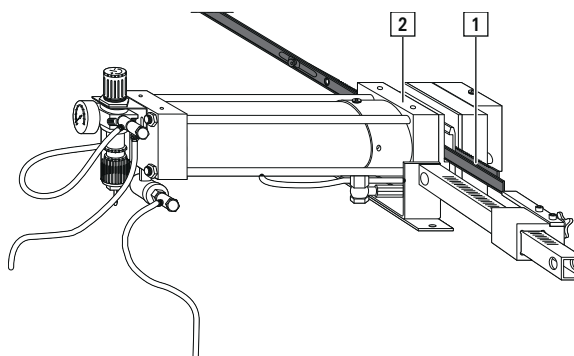
Cropping with a pneumatic cropper (hole punching)

In the delivery state, hardware components are 10 mm longer than the nominal dimension.



Assignment	Description
[1]	Hardware delivery state
[2]	Hardware, cropped

1. Place the hardware component in the required position.
2. Mark the length on the hardware component.
3. Insert the hardware component [1] into the pneumatic cropper [2].



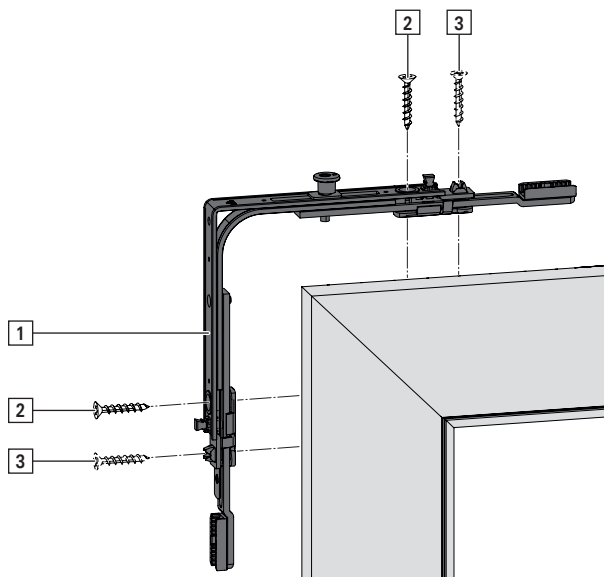
4. Align the hardware component.
5. Crop the hardware component.



7.7.4 Corner drive

Installing the corner drive

1. Insert the corner drives [1] and screw them down with two screws [2].

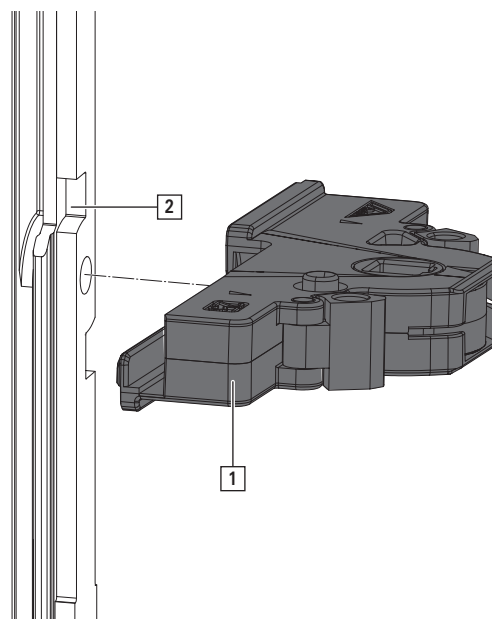


2. After all of the connector components have been installed, screw down the corner drives with a further two screws [3]. → 7.5 "Force-fit connection" from page 74

7.7.5 T&T espagnolette BS ≥ 25

Gearbox

1. Insert the gearbox [1] into the espagnolette faceplate [2] rotated by 90°. While doing so, insert the cam into the hole provided.

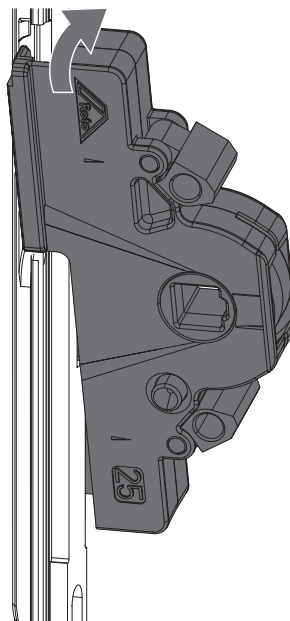


Installation

Sash

T&T espagnolette BS $\geq$ 25

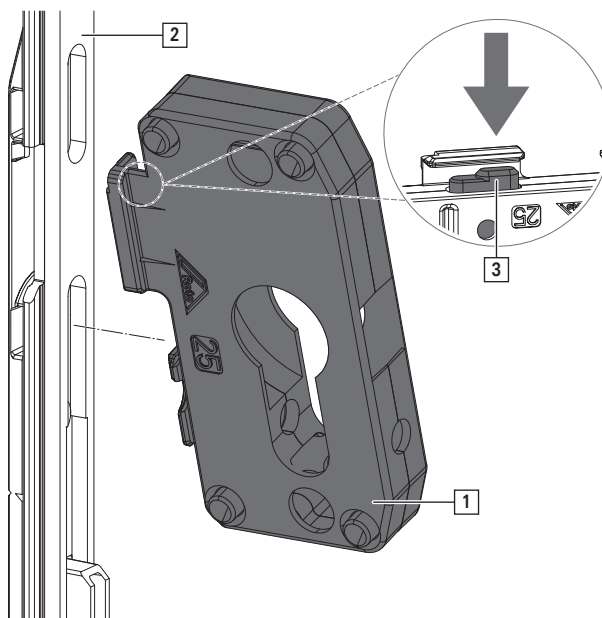
2. Turn the gearbox clockwise until the gearbox clicks into place.
The gearbox is positioned flush with the espagnolette faceplate.



3. For dismantling, turn the gearbox anticlockwise until the gearbox comes out of the groove. Remove from the espagnolette faceplate.

Lock casing

1. If the locking lug [3] is protruding, push it back into the lock casing [1].
Turn the lock casing slightly before inserting it into the espagnolette faceplate [2].





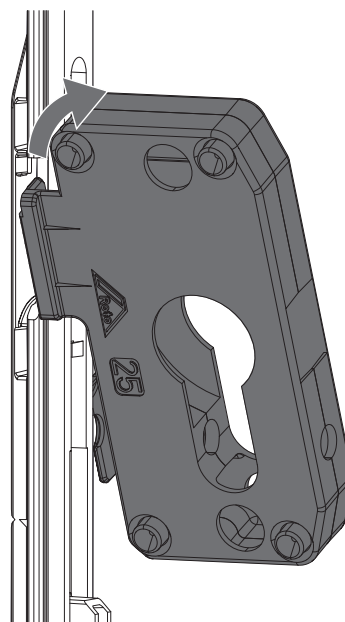
2. Insert the lock casing into the groove and turn clockwise until the lock casing clicks into place.
- The lock casing is positioned flush with the espagnolette faceplate.



ATTENTION Improper installation of the lock casing may cause property damage.

Turning the lock casing in incorrectly can damage the links.

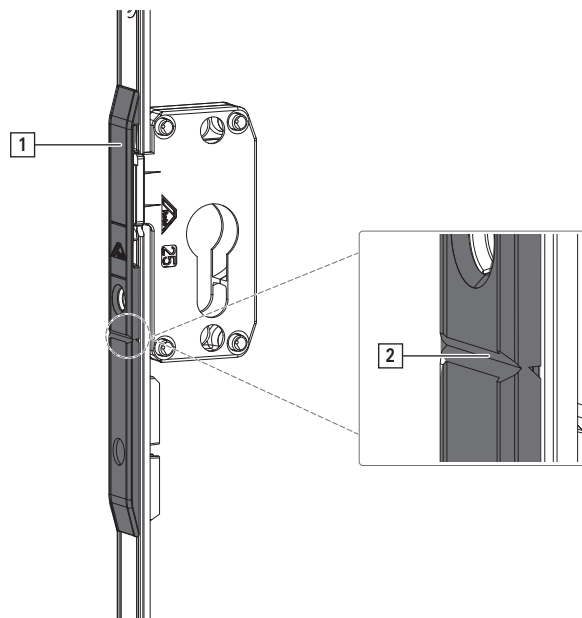
- Ensure ease of movement when turning in.
- Reposition the lock casing if excessive force is required.



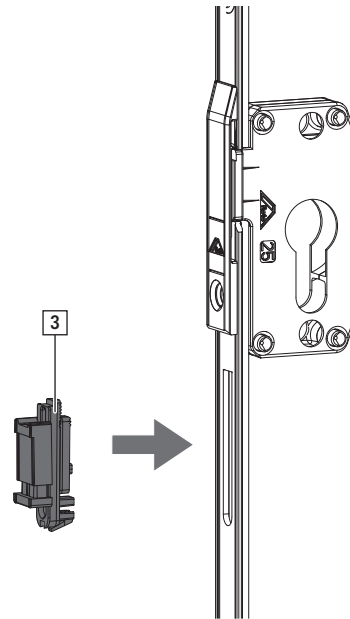
3. For dismantling, turn the lock casing anticlockwise until the lock casing comes out of the groove.
Remove from the espagnolette faceplate.

Bullet catch

1. Snap the cover [1] apart at the notch [2].
Remove the lower part of the cover.



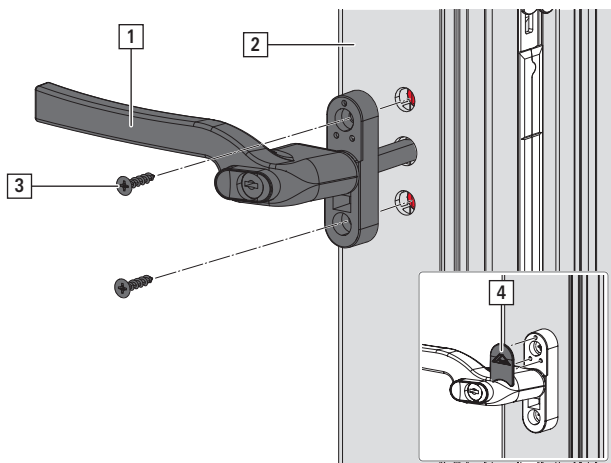
2. Insert the bullet catch [3].



7.7.6 Handle

7.7.6.1 Installation

1. Move the handle [1] to the turn position.
2. Insert the handle into the sash [2].



3. Fasten the handle with two screws [3].
4. Attach the cover [4].

7.7.6.2 Undoing the centre fixing



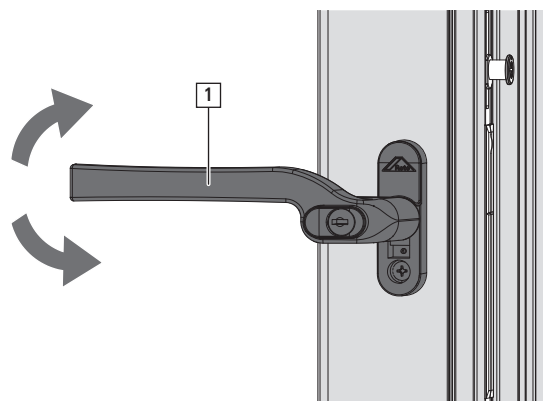
INFO

All couplable components are delivered with a centre fixing.

Turning the handle undoes the centre fixing of the hardware components. Undo the centre fixing with the sash open.



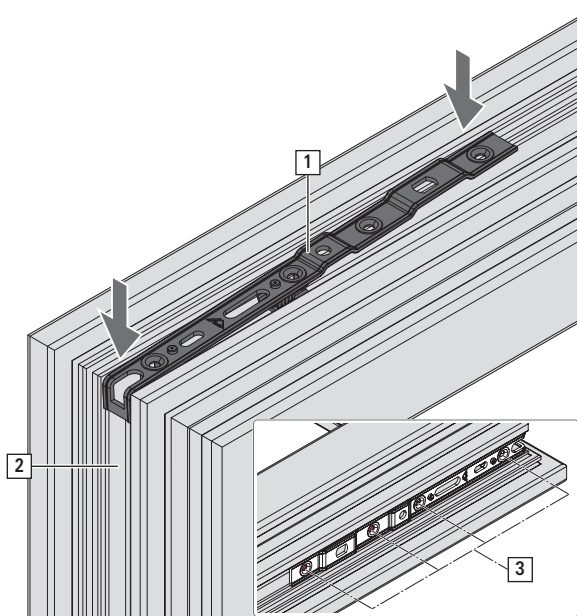
1. Turn the handle [1] in one direction as far as it will go.
Audible cracking noise.



2. Turn the handle in the opposite direction as far as it will go.
Audible cracking noise.
3. Turn the handle in both directions again and check for ease of movement.

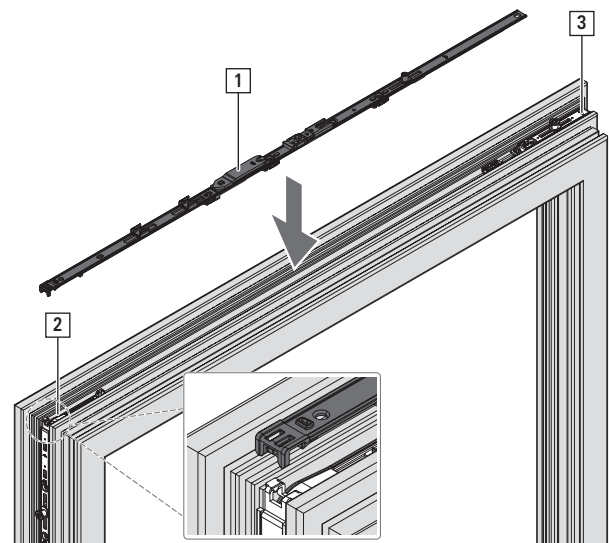
7.7.7 Rebate stay guide

1. Push the rebate stay guide [1] into the sash groove [2].
Check that it is seated flush.
2. Fasten with four screws [3].



7.7.8 Stay guide

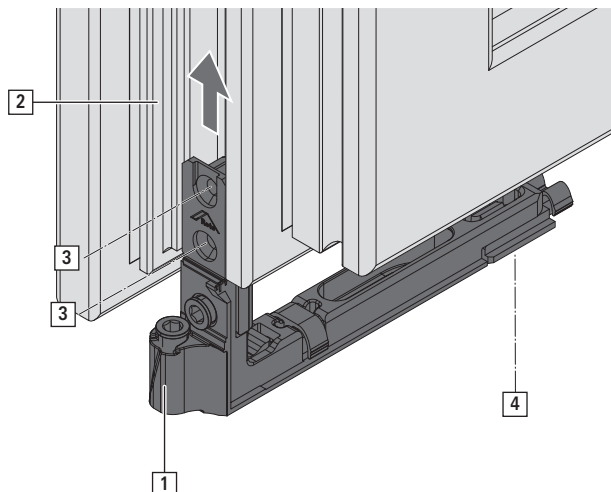
1. Insert the stay guide [1] into the sash groove and clip it into the sash stay corner drive [2].



2. Connect the stay guide to the corner drive [3]. Create a force-fit connection → *from page 74*.
3. Screw down the stay guide. Use all screw positions.

7.7.9 Corner hinge

1. Place the corner hinge [1] on the sash [2] and push it upwards in the sash groove. Check that it is seated flush.



2. Fasten with three screws [3] + [4].



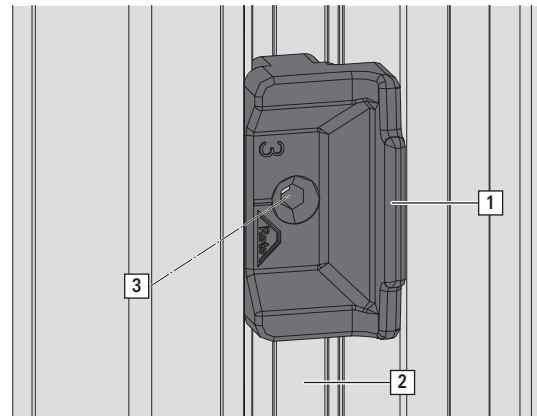
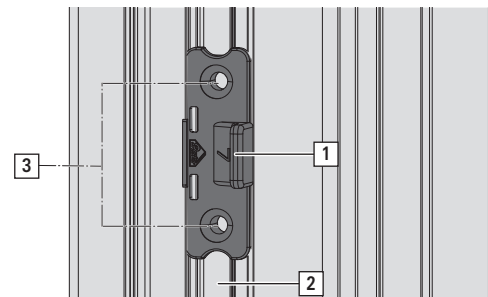
INFO

Tighten the screw [4] on the horizontal leg to a maximum torque of 2 Nm.



7.7.10 Centre closer

1. Place the centre closer [1] in the sash groove [2].
Positioning → *from page 90.*



2. Fasten with one or two screws [3].

7.7.11 Tilt stay



INFO

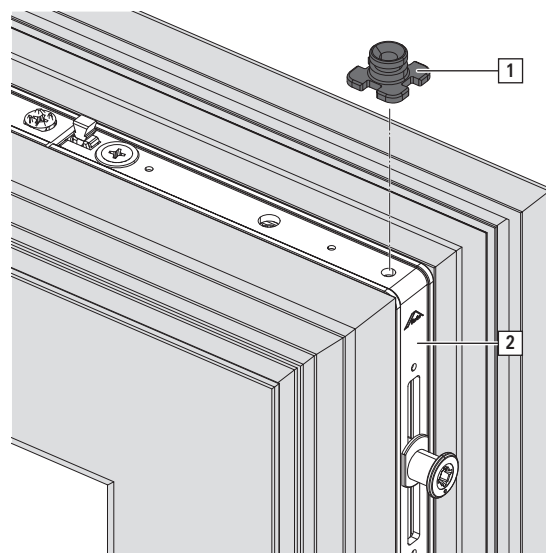
Tilt stays are not a security component in accordance with DIN EN 13126-5.



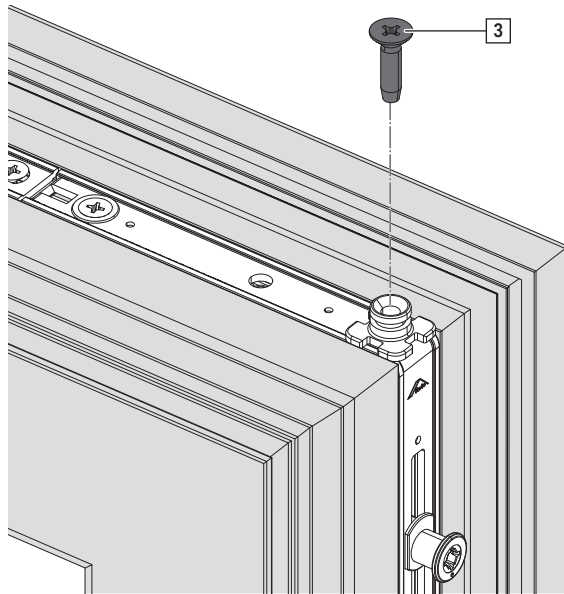
INFO

Tilt stays do not have a braking effect. The sash can fall shut due to the force of the wind.

1. Position the sash component [1] on the corner drive [2].



2. Fasten with a screw [3].

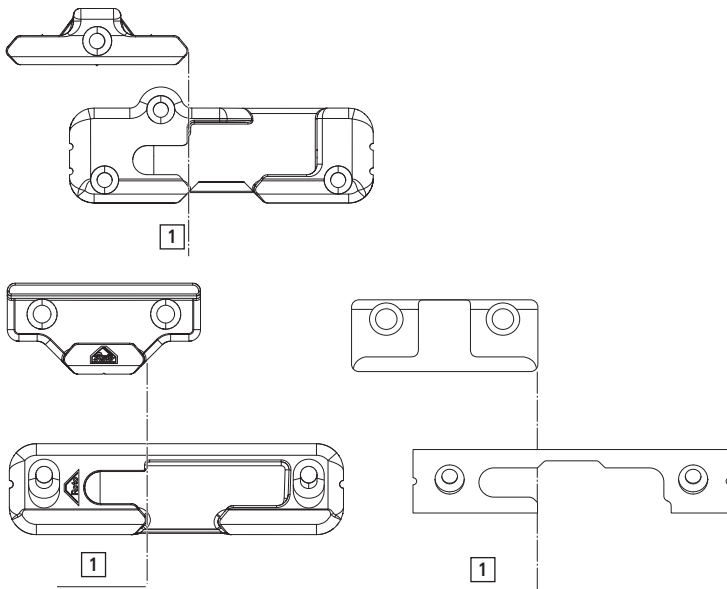


7.8 Frame

7.8.1 Position of strikers and tilt strikers

7.8.1.1 Striker positions and tilt strikers

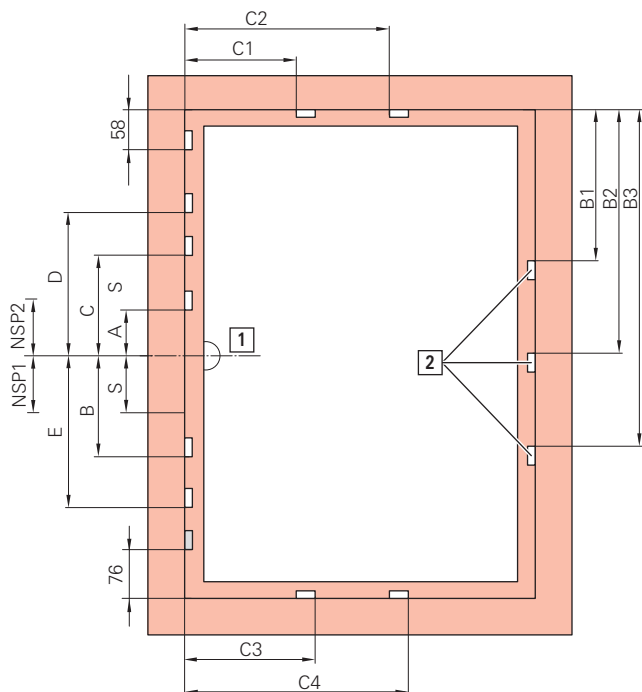
Positioning of the strikers and tilt strikers on the basis of the point of entry [1] in the turn position:





7.8.1.2 High backset espagnolette (T&T espagnolette BS ≥ 25)

Basic security



[1] Handle centre

[2] Centre closer, concealed

□ Striker

■ SEC striker

T&T espagnolette BS ≥ 25

SRH [mm]	A	B	C	D	E	NSP1	NSP2	S
520 – 620	–	–	–	–	–	–	–	–
621 – 800	125	–	–	–	–	137	–	–
801 – 1200	125	–	–	–	–	137	–	–
1201 – 1600	125	340	–	–	–	137	–	–
1601 – 2000	–	312	358	–	–	–	109	395
2001 – 2400	–	312	358	758	740	–	109	395

PVC

Centre closer, vertical, concealed, without load transfer

SRH [mm]	B1	B2	B3
801 – 1200	550	–	–
1201 – 1400	746	–	–
1401 – 1800	746	1150	–
1801 – 2000	746	1346	–
2001 – 2400	746	1346	1750

Centre closer, vertical, concealed, with load transfer

SRH [mm]	B1	B2	B3
1001 – 1200	550	–	–
1201 – 1400	746	–	–
1401 – 1600	746	946	–
1601 – 1800	746	1150	–
1801 – 2000	746	1346	–

Installation

Frame

Position of strikers and tilt strikers

SRH [mm]	B1	B2	B3
2001 – 2200	746	1346	1546
2201 – 2400	746	1346	1750

Centre lock, horizontal, top

SRW [mm]	C1	C2	Centre lock
801 – 1200	480	–	CL 400 E
1201 – 1400	676	–	CL 600 E
1401 – 1750	676	1080	CL 600 E KU + CL 400 E

Centre lock, horizontal, bottom

SRW [mm]	C3	C4	Bottom
801 – 1200	462	–	CL 400 E
1201 – 1400	658	–	CL 600 E
1401 – 1750	658	1062	CL 600 E KU + CL 400 E

Timber

Centre closer, vertical, concealed

SRH [mm]	B1	B2	B3
1001 – 1200	550	–	–
1201 – 1800	746	–	–
1801 – 2400	746	1346	–

Centre lock, horizontal, top

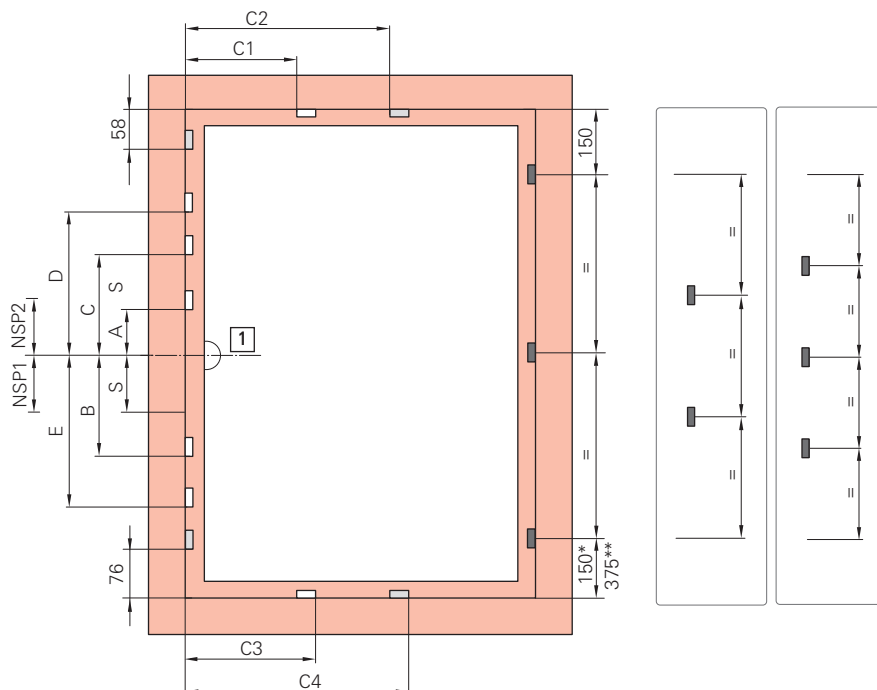
SRW [mm]	C1	C2	Centre lock
1101 – 1600	676	–	CL 600 E
1601 – 1750	676	1080	CL 600 E KU + CL 400 E

Centre lock, horizontal, bottom

SRW [mm]	C3	C4	Bottom
1101 – 1600	658	–	CL 600 E
1601 – 1750	658	1062	CL 600 E KU + CL 400 E



RC 1 N – centre closers



[1] Handle centre

* without load transfer

** with load transfer

□ Striker

▒ SEC striker

■ Centre closer, concealed

T&T espagnolette BS ≥ 25

SRH [mm]	A	B	C	D	E	NSP1	NSP2	S
520 – 620	–	–	–	–	–	–	–	–
621 – 800	125	–	–	–	–	137	–	–
801 – 1200	125	–	–	–	–	137	–	–
1201 – 1600	125	340	–	–	–	137	–	–
1601 – 2000	–	312	358	–	–	–	109	395
2001 – 2400	–	312	358	758	740	–	109	395

Centre lock, horizontal, top

SRW [mm]	C1	C2	Centre lock
650 – 750	276	–	CL 200 P
751 – 950	480	–	CL 400 P
951 – 1150	676	–	CL 600 P
1151 – 1350	676	876	CL 600 E KU + CL 200 P
1351 – 1550	676	1080	CL 600 E KU + CL 400 P
1551 – 1600	676	1276	CL 600 E KU + CL 600 P

Centre lock, horizontal, bottom

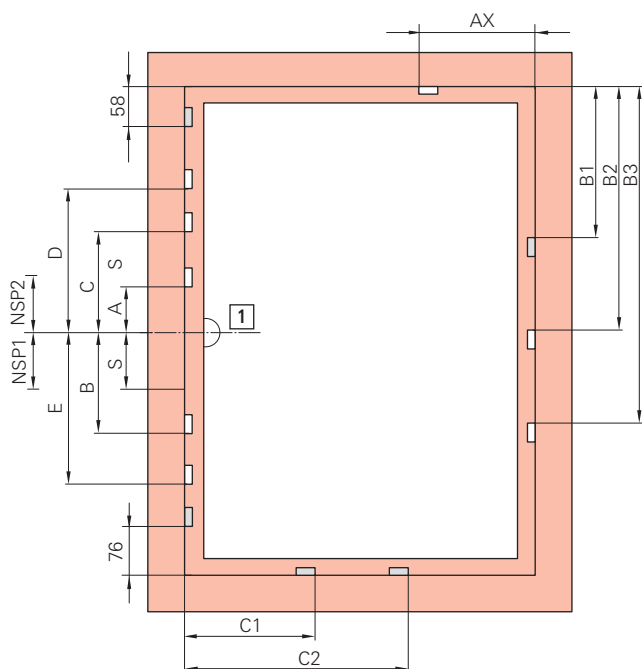
SRW [mm]	C3	C4	Centre lock
650 – 850	462	–	CL 400 P
851 – 1050	658	–	CL 600 P
1051 – 1250	658	858	CL 600 E KU + CL 200 P
1251 – 1450	658	1062	CL 600 E KU + CL 400 P
1451 – 1600	658	1258	CL 600 E KU + CL 600 P

Installation

Frame

Position of strikers and tilt strikers

RC 1 N



[1] Handle centre

□ Striker

■ SEC striker

T&T espagnolette BS ≥ 25

SRH [mm]	A	B	C	D	E	NSP1	NSP2	S
520 – 620	–	–	–	–	–	–	–	–
621 – 800	125	–	–	–	–	137	–	–
801 – 1200	125	–	–	–	–	137	–	–
1201 – 1600	125	340	–	–	–	137	–	–
1601 – 2000	–	312	358	–	–	–	109	395
2001 – 2400	–	312	358	758	740	–	109	395

Stay guide

SRW [mm]	AX	Size
801 – 1000	600	500 / 890
1001 – 1200	750	500 / 1090
1201 – 1600	750	500 / 1290

PVC

Centre lock, vertical, without load transfer

SRH [mm]	B1	B2	B3	Centre lock
801 – 1200	550	–	–	CL 400 E
1201 – 1400	746	–	–	CL 600 E
1401 – 1800	746	1150	–	CL 600 E KU + CL 400 E
1801 – 2000	746	1346	–	CL 600 E KU + CL 600 E
2001 – 2400	746	1346	1750	CL 600 E KU + CL 600 E KU + CL 400 E

Centre lock, vertical, with load transfer

SRH [mm]	B1	B2	B3	Centre lock
1001 – 1200	550	–	–	CL 400 E
1201 – 1400	746	–	–	CL 600 E
1401 – 1600	746	946	–	CL 600 E KU + CL 200 P
1601 – 1800	746	1150	–	CL 600 E KU + CL 400 E



SRH [mm]	B1	B2	B3	Centre lock
1801 – 2000	746	1346	–	CL 600 E KU + CL 600 E
2001 – 2200	746	1346	1546	CL 600 E KU + CL 600 E KU + CL 200 P
2201 – 2400	746	1346	1750	CL 600 E KU + CL 600 E KU + CL 400 E

Centre lock, horizontal

SRW [mm]	C1	C2	Centre lock
650 – 850	462	–	CL 400 P
851 – 1050	658	–	CL 600 P
1051 – 1250	658	858	CL 600 E KU + CL 200 P
1251 – 1450	658	1062	CL 600 E KU + CL 400 P
1451 – 1600	658	1258	CL 600 E KU + CL 600 P

Timber

Centre lock, vertical, without load transfer

SRH [mm]	B1	B2	Centre lock
1101 – 1800	746	–	CL 600 E
1801 – 2400	746	1346	CL 600 E KU + CL 600 E

Centre lock, vertical, with load transfer

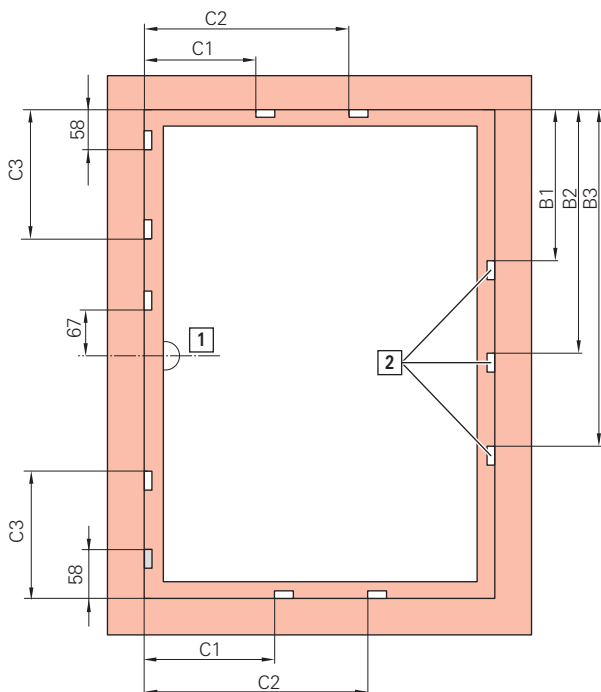
SRH [mm]	B1	B2	Centre lock
1101 – 1150	550	–	CL 400 E
1151 – 1800	746	–	CL 600 E
1801 – 2400	746	1346	CL 600 E KU + CL 600 E

Centre lock, horizontal

SRW [mm]	C1	C2	Centre lock
650 – 850	462	–	CL 400 P
851 – 1050	658	–	CL 600 P
1051 – 1250	658	858	CL 600 E KU + CL 200 P
1251 – 1450	658	1062	CL 600 E KU + CL 400 P
1451 – 1600	658	1258	CL 600 E KU + CL 600 P

7.8.1.3 TSH 30

Basic security



- [1] Handle centre
 [2] Centre closer, concealed

□ Striker
 ■ SEC striker

PVC

Centre closer, vertical, concealed, without load transfer

SRH [mm]	B1	B2	B3
801 – 1200	550	–	–
1201 – 1400	746	–	–
1401 – 1800	746	1150	–
1801 – 2000	746	1346	–
2001 – 2400	746	1346	1750

Centre closer, vertical, concealed, with load transfer

SRH [mm]	B1	B2	B3
1001 – 1200	550	–	–
1201 – 1400	746	–	–
1401 – 1600	746	946	–
1601 – 1800	746	1150	–
1801 – 2000	746	1346	–
2001 – 2200	746	1346	1546
2201 – 2400	746	1346	1750

Centre lock, horizontal, top

SRW [mm]	C1	C2	Centre lock
801 – 1200	480	–	CL 400 E
1201 – 1400	676	–	CL 600 E
1401 – 1750	676	1080	CL 600 E KU + CL 400 E


Centre lock, horizontal, bottom

SRW [mm]	C1	C2	Bottom
801 – 1200	480	–	CL 400 E
1201 – 1400	676	–	CL 600 E
1401 – 1750	676	1080	CL 600 E KU + CL 400 E

Centre lock, vertical

SRH [mm]	C3	Bottom
1401 – 1800	462	CL 400 E
1801 – 2200	658	CL 600 E

Timber
Centre closer, vertical, concealed

SRH [mm]	B1	B2	B3
1001 – 1200	550	–	–
1201 – 1800	746	–	–
1801 – 2400	746	1346	–

Centre lock, horizontal, top

SRW [mm]	C1	C2	Centre lock
1101 – 1600	676	–	CL 600 E
1601 – 1750	676	1080	CL 600 E KU + CL 400 E

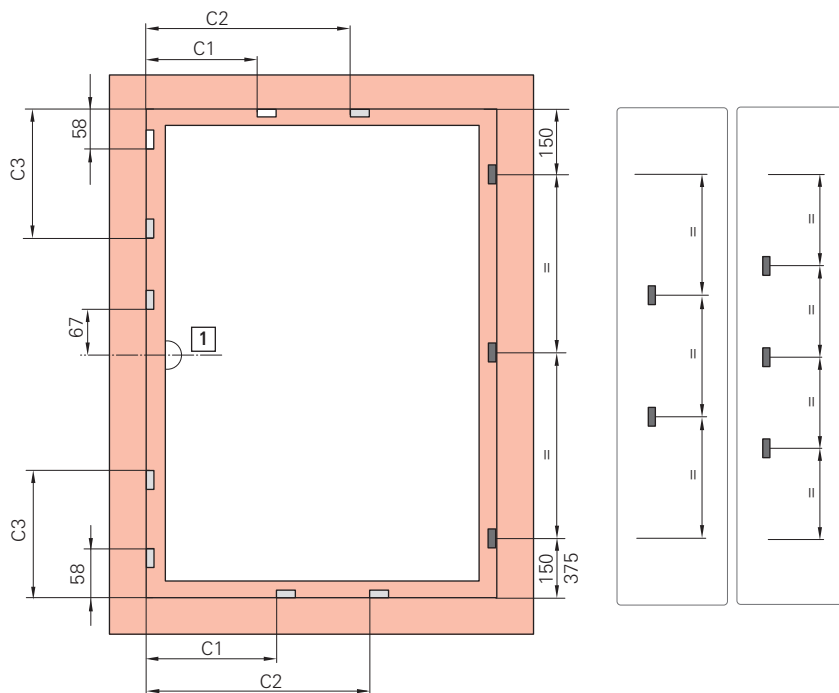
Centre lock, horizontal, bottom

SRW [mm]	C3	C4	Bottom
1101 – 1600	676	–	CL 600 E
1601 – 1750	676	1080	CL 600 E KU + CL 400 E

Centre lock, vertical

SRH [mm]	C3	Bottom
1401 – 1800	462	CL 400 E
1801 – 2200	658	CL 600 E

RC 1 N – centre closers



[1] Handle centre

□ Striker

■ SEC striker

■ Centre closer, concealed

Centre lock, horizontal, top

SRW [mm]	C1	C2	Centre lock
650 – 750	276	–	CL 200 P
751 – 950	480	–	CL 400 P
951 – 1150	676	–	CL 600 P
1151 – 1350	676	876	CL 600 E KU + CL 200 P
1351 – 1550	676	1080	CL 600 E KU + CL 400 P
1551 – 1600	676	1276	CL 600 E KU + CL 600 P

Centre lock, vertical, espagnolette side

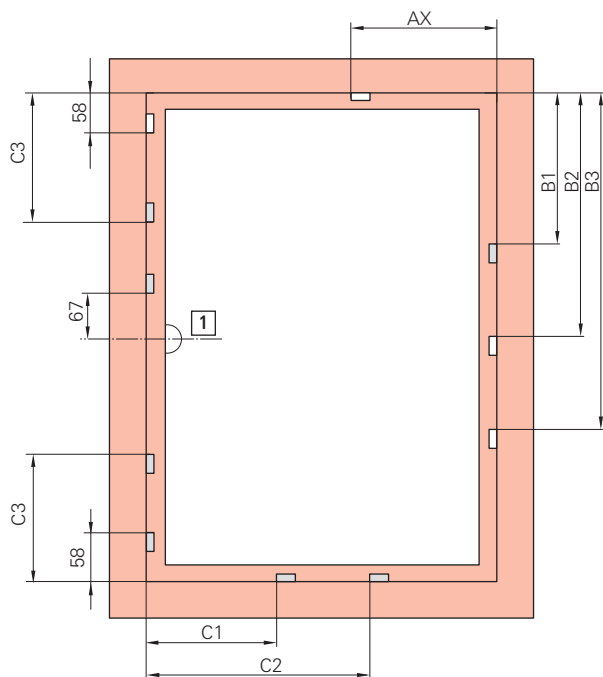
SRH [mm]	C3	Centre lock
1401 – 1800	462	CL 400 E
1801 – 2200	658	CL 600 E

Centre lock, horizontal, bottom

SRW [mm]	C1	C2	Centre lock
650 – 850	480	–	CL 400 P
851 – 1050	676	–	CL 600 P
1051 – 1250	676	876	CL 600 E KU + CL 200 P
1251 – 1450	676	1080	CL 600 E KU + CL 400 P
1451 – 1600	676	1276	CL 600 E KU + CL 600 P



RC 1 N



[1] Handle centre

□ Striker

■ SEC striker

Stay guide

SRW [mm]	AX	Size
801 – 1000	600	500 / 890
1001 – 1200	750	500 / 1090
1201 – 1600	750	500 / 1290

PVC

Centre lock, vertical, without load transfer

SRH [mm]	B1	B2	B3	Centre lock
801 – 1200	550	–	–	CL 400 E
1201 – 1400	746	–	–	CL 600 E
1401 – 1800	746	1150	–	CL 600 E KU + CL 400 E
1801 – 2000	746	1346	–	CL 600 E KU + CL 600 E
2001 – 2400	746	1346	1750	CL 600 E KU + CL 600 E KU + CL 400 E

Centre lock, vertical, with load transfer

SRH [mm]	B1	B2	B3	Centre lock
1001 – 1200	550	–	–	CL 400 E
1201 – 1400	746	–	–	CL 600 E
1401 – 1600	746	946	–	CL 600 E KU + CL 200 P
1601 – 1800	746	1150	–	CL 600 E KU + CL 400 E
1801 – 2000	746	1346	–	CL 600 E KU + CL 600 E
2001 – 2200	746	1346	1546	CL 600 E KU + CL 600 E KU + CL 200 P
2201 – 2400	746	1346	1750	CL 600 E KU + CL 600 E KU + CL 400 E

Centre lock, vertical, espagnolette side

SRH [mm]	C3	Bottom
1401 – 1800	462	CL 400 E
1801 – 2200	658	CL 600 E

Installation

Frame

Sash stay / rebate sash stay

Centre lock, horizontal

SRW [mm]	C1	C2	Centre lock
650 – 850	480	–	CL 400 P
851 – 1050	676	–	CL 600 P
1051 – 1250	676	876	CL 600 E KU + CL 200 P
1251 – 1450	676	1080	CL 600 E KU + CL 400 P
1451 – 1600	676	1276	CL 600 E KU + CL 600 P

Timber

Centre lock, vertical, without load transfer

SRH [mm]	B1	B2	Centre lock
1101 – 1800	746	–	CL 600 E
1801 – 2400	746	1346	CL 600 E KU + CL 600 E

Centre lock, vertical, with load transfer

SRH [mm]	B1	B2	Centre lock
1101 – 1150	550	–	CL 400 E
1151 – 1800	746	–	CL 600 E
1801 – 2400	746	1346	CL 600 E KU + CL 600 E

Centre lock, vertical, espagnolette side

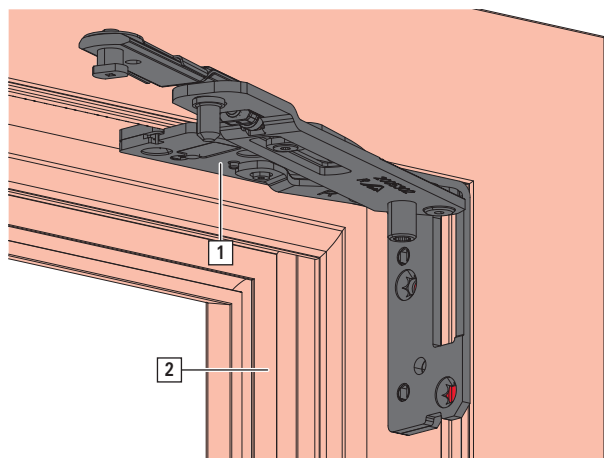
SRH [mm]	C3	Bottom
1401 – 1800	462	CL 400 E
1801 – 2200	658	CL 600 E

Centre lock, horizontal

SRW [mm]	C1	C2	Centre lock
650 – 850	480	–	CL 400 P
851 – 1050	676	–	CL 600 P
1051 – 1250	676	876	CL 600 E KU + CL 200 P
1251 – 1450	676	1080	CL 600 E KU + CL 400 P
1451 – 1600	676	1276	CL 600 E KU + CL 600 P

7.8.2 Sash stay / rebate sash stay

1. Place the sash stay / rebate sash stay [1] in the frame [2].





2. Fasten with five screws.

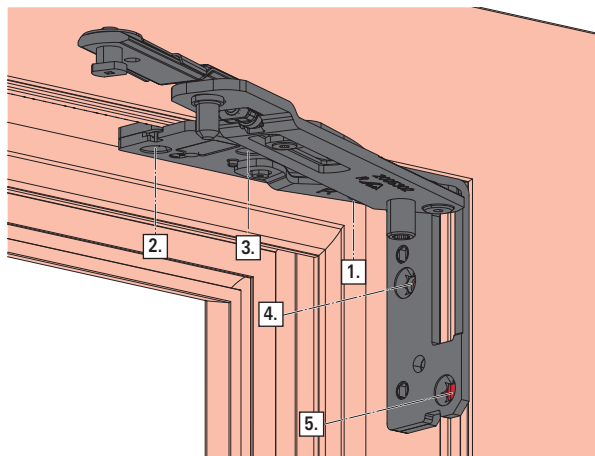
Recommended screw sequence

Tighten the rear screw [1.] on the horizontal leg first. Then tighten screws [2.], [3.], [4.] and [5.].



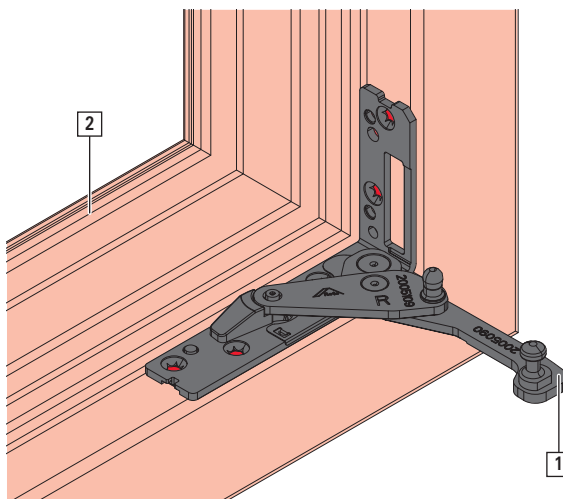
INFO

Check that the screws are seated flush. The screws must not protrude beyond the baseplate by more than 0.2 mm.



7.8.3 Pivot rest

1. Place the pivot rest [1] on the frame [2].



2. Fasten with five screws.

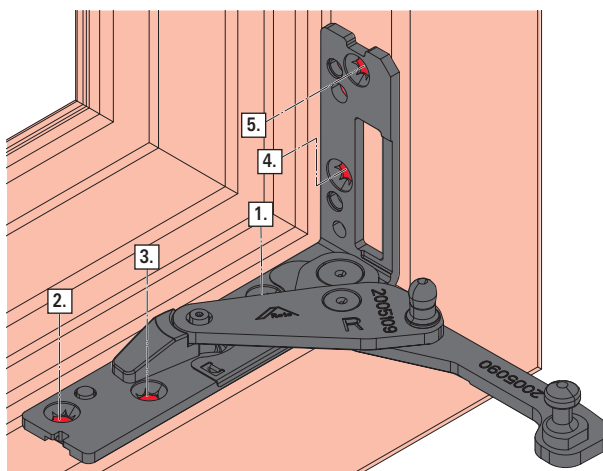
Recommended screw sequence

Tighten the rear screw [1.] on the horizontal leg first. Then tighten screws [2.], [3.], [4.] and [5.].



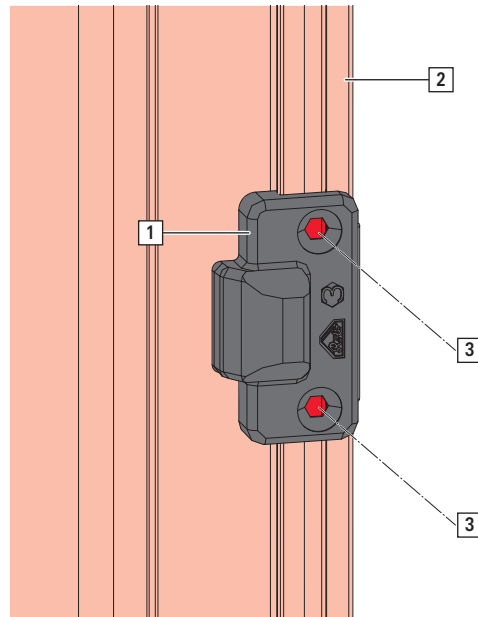
INFO

Check that the screws are seated flush. The screws must not protrude beyond the baseplate by more than 0.2 mm.



7.8.4 Centre closer

1. Position the centre closer [1] in the frame [2] → *from page 90.*



2. Fasten with two screws [3].



INFO

Put pressure-proof packers between glass and frame in the area of the centre closers.

7.8.5 Tilt stay



INFO

Tilt stays are not a security component in accordance with DIN EN 13126-5.



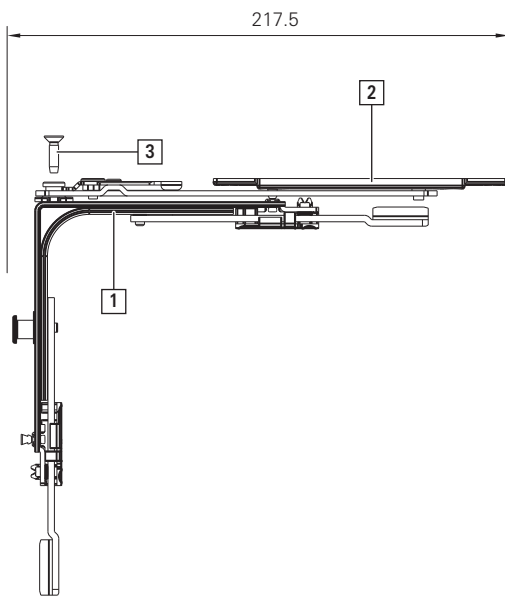
INFO

Tilt stays do not have a braking effect. The sash can fall shut due to the force of the wind.



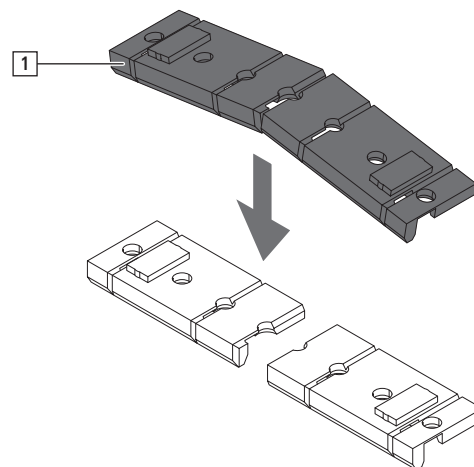
INFO

With a smooth rebate, no packers are required.

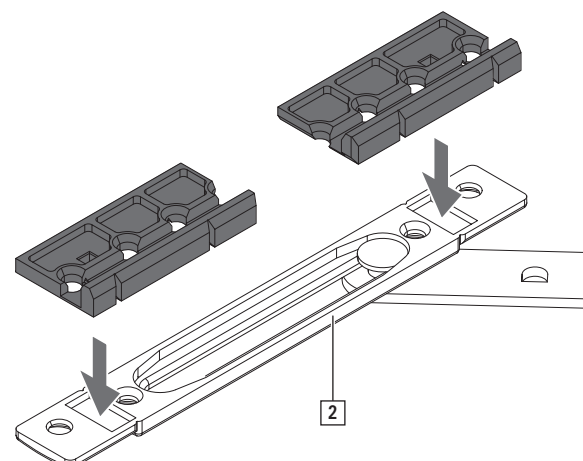


- [1] Corner drive, standard
- [2] Tilt stay
- [3] Mounting screw

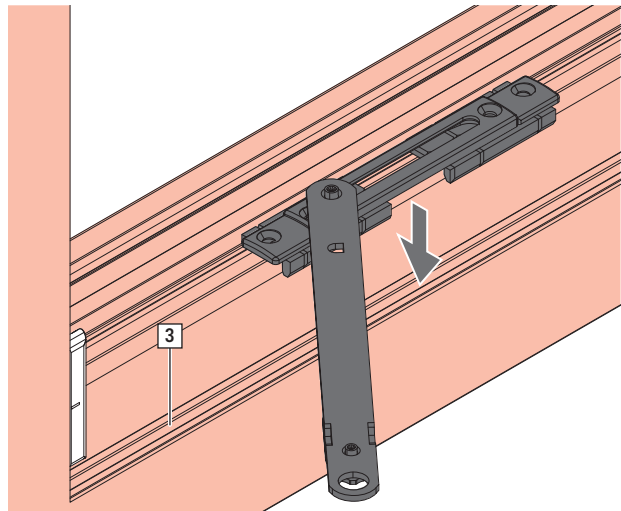
1. Break the packer [1] apart in the centre.



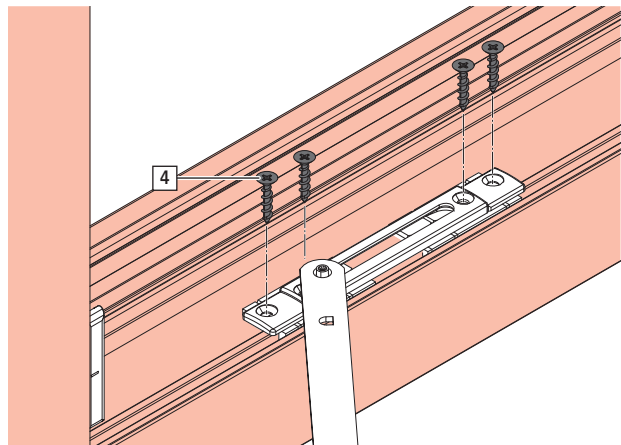
2. Push the packer into the tilt stay [2].



3. Position the tilt stay in the frame [3].



4. Fasten with four screws [4].



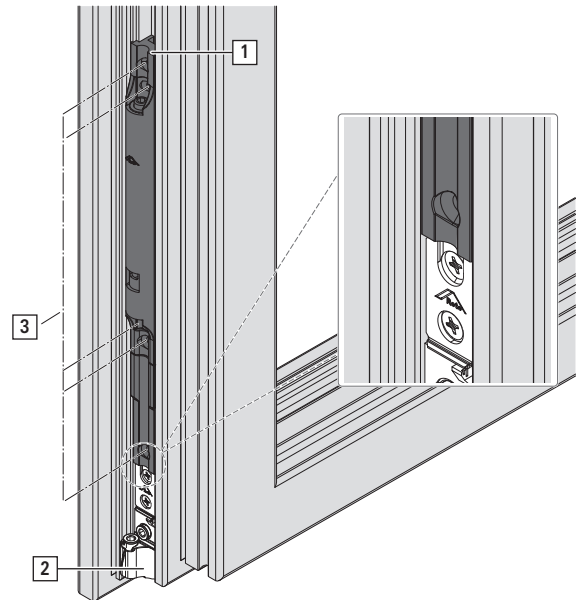


7.9 Accessories

7.9.1 Load transfer

7.9.1.1 Sash component

1. Insert the load transfer sash component [1] up to the stop to the corner hinge [2].



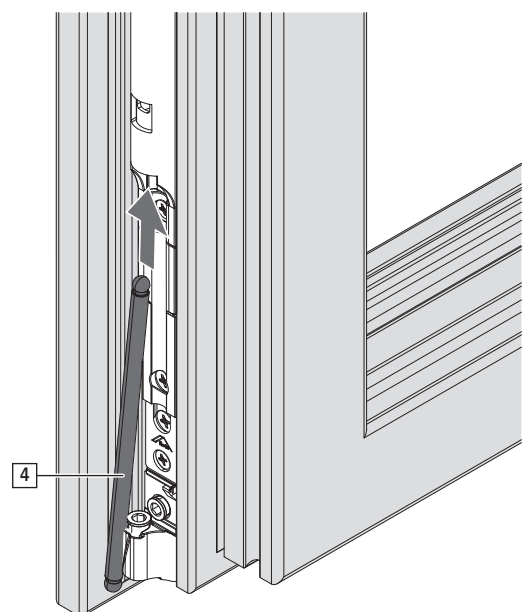
2. Fasten with five screws [3].



INFO

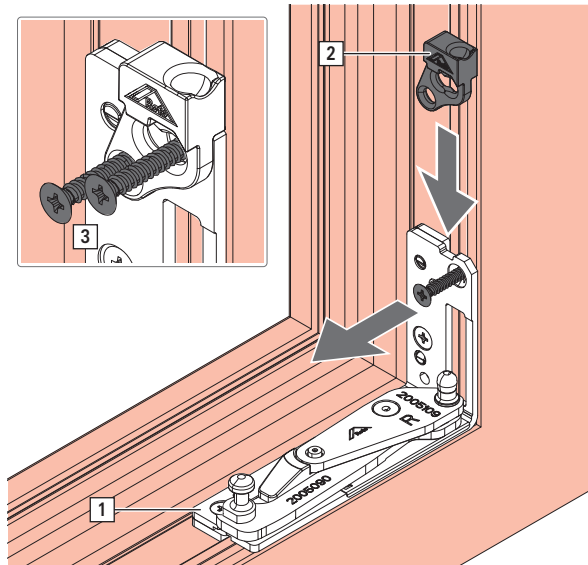
Tighten the screws to a maximum torque of 2 Nm.

3. Push the support rod [4] into the load transfer so that it clicks into place.



7.9.1.2 Frame component

1. Undo the top screw fixing from the pivot rest [1].



2. Place the load transfer frame component [2] on the pivot rest and fasten with two screws [3].
3. Join the load transfer frame component and sash component together → *from page 113*.

7.9.2 Travel restrictor

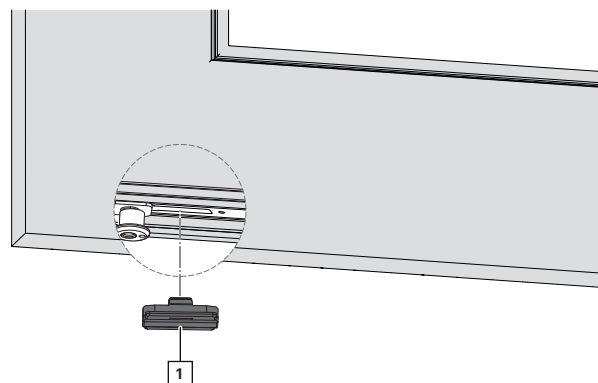


INFO

Stay arm – standard and stay guide

Only install the travel restrictor once the sash and frame have been joined together.

1. Clip the travel restrictor [1] into the locking cam groove.
Refer to the hardware overviews for the positioning → *from page 30*.





7.10 Joining the sash and frame



INFO

This work can only be carried out from the outside (e.g. facade lift).



CAUTION

Heavy loads pose the risk of injury and property damage.

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

- ▶ Transport and installation must be carried out by at least two people.
- ▶ Use transportation means. → 12 "Transport" from page 134

7.10.1 Connecting the corner hinge to the pivot rest

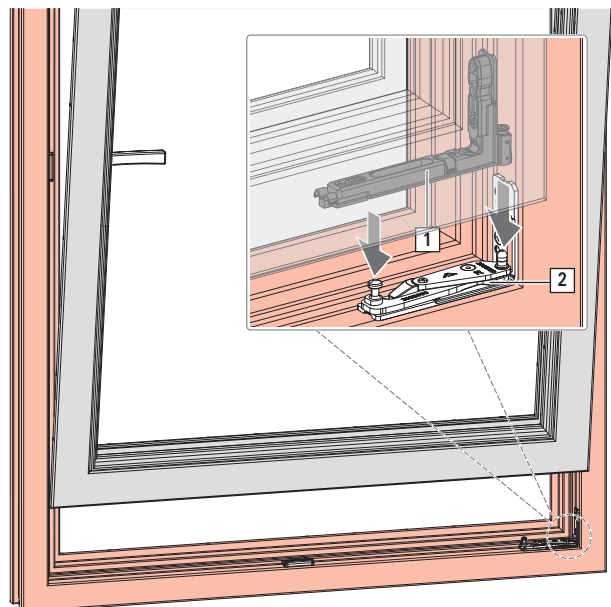
⇒ Pivot rest in initial position

1. Push down on the lifting mishandling device (if fitted).
2. Handle in turn position.

Turn-Only hardware



3. With the sash slightly tilted, guide it along the frame in a downwards direction until you feel the corner hinge [1] engage in the pivot rest [2].



Installation

Joining the sash and frame

Mounting the stay arm – mounting bolt

- Secure the sash to prevent it from falling.



WARNING **Potential risk of death caused by an unsecured sash!**

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

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

- Connect the sash stay → *from page 108*.

7.10.2 Mounting the stay arm – mounting bolt

⇒ The corner hinge and pivot rest are joined together → *from page 107*

⇒ The travel restrictor is not installed yet → *from page 106*

- Secure the sash to prevent it from falling.

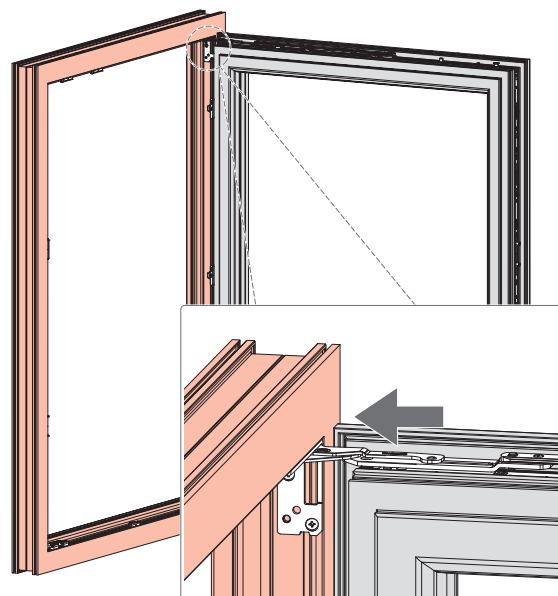


WARNING **Potential risk of death caused by an unsecured sash!**

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

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

- Turn the sash and stay arm to 90°. Push the sash slightly towards the frame at the top.



- Push down on the lifting mishandling device (if fitted).



4. Move the handle to the tilt position.

Turn-Only hardware



INFO

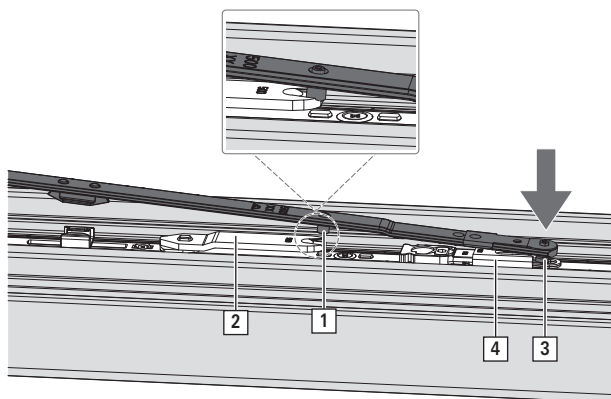
Under normal circumstances, this constitutes incorrect operation of the hardware, but it is a necessary step in this case.

5. Place the stay arm mounting bolt [1] on the stay guide supporting arm [2].



INFO

The mounting bolt must be at the depth of the supporting arm.



6. Push the bayonet bolt [3] in the front downwards so that it can extend underneath the mounting plate [4].

7. Pull the sash away from the frame until you hear the stay arm click into place.

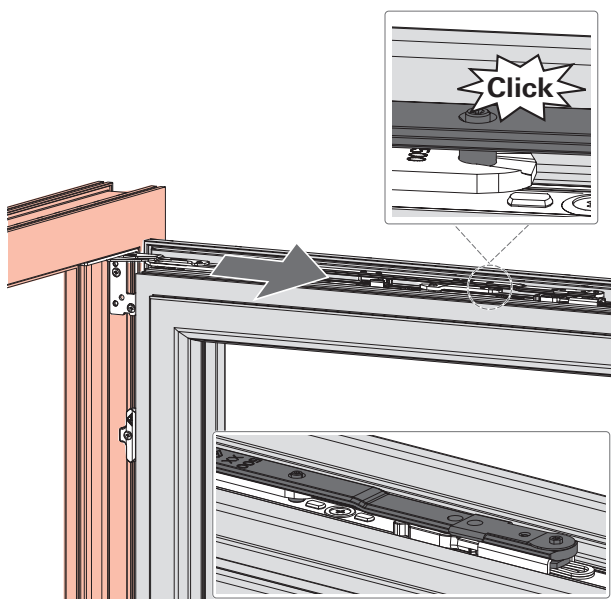


WARNING

Potential risk of death caused by the sash falling!

The sash may fall if the stay arm is not correctly positioned in the stay guide.

- ▶ Check correct mounting.
The mounting bolt and the bayonet bolt must be locked in the stay guide.
- ▶ The stay arm must audibly click into place.



Installation

Joining the sash and frame

Mounting the stay arm – mounting lock

8. Push down on the lifting mishandling device (if fitted).

9. Move the handle to the turn position.

Turn-Only hardware



10. Install the travel restrictor → *from page 106*.

7.10.3 Mounting the stay arm – mounting lock

⇒ The corner hinge and pivot rest are joined together

⇒ The travel restrictor is not installed yet → *from page 106*

1. Secure the sash to prevent it from falling.



WARNING

Potential risk of death caused by an unsecured sash!

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

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

2. Turn the sash and stay arm to 90°.

3. Push down on the lifting mishandling device (if fitted).

4. Move the handle to the tilt position.

Turn-Only hardware

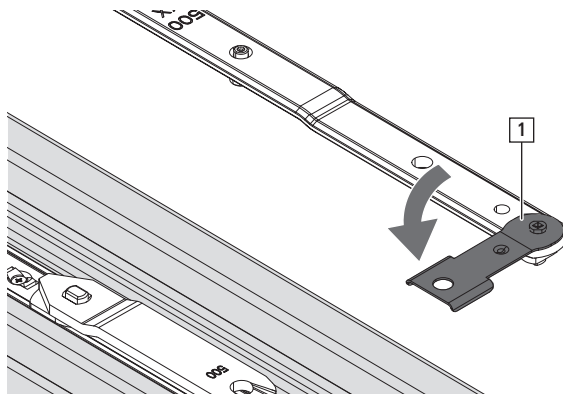


INFO

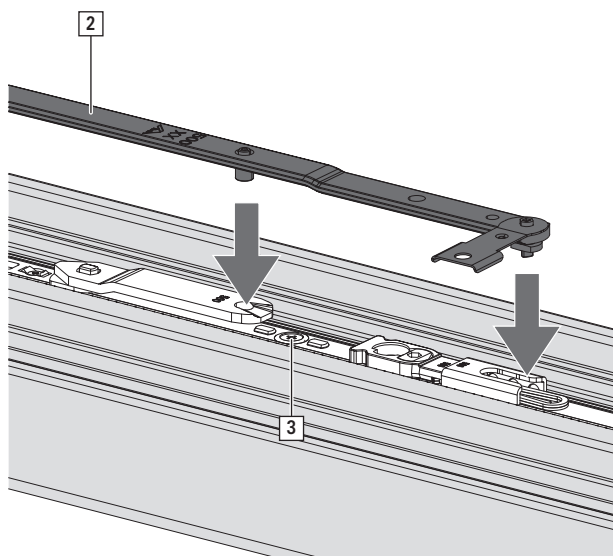
Under normal circumstances, this constitutes incorrect operation of the hardware, but it is a necessary step in this case.



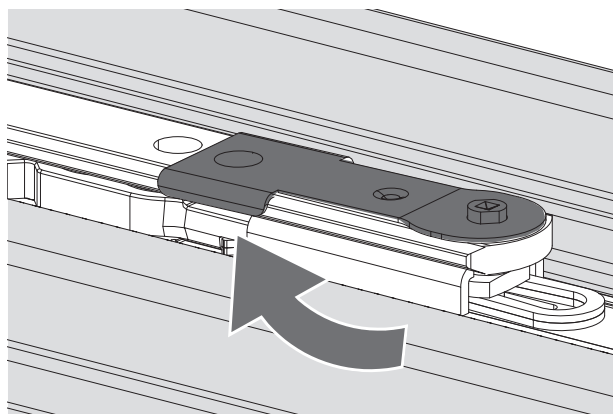
5. Turn the bayonet bolt 90° using the plate [1], lifting the plate slightly while doing so.



6. Position the stay arm [2] over the stay guide [3] and push it downwards so that the mounting bolt extends into the supporting arm and the bayonet bolt extends into the mounting plate.



7. Turn the bayonet bolt 90° using the plate so that the plate engages on the sash stay rod again.



INFO

The plate must be easy to turn. If a lot of force is required or if it is jammed, check the position of the bolt in the mounting plate.



WARNING

Potential risk of death caused by the sash falling!

The sash may fall if the stay arm is not correctly positioned in the stay guide.

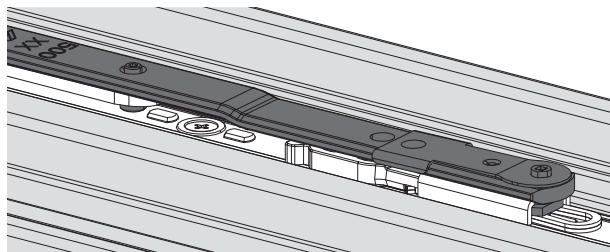
- ▶ Check correct mounting.
The mounting bolt and the bayonet bolt must be locked in the stay guide.
- ▶ The stay arm must audibly click into place.

Installation

Joining the sash and frame

Mounting the rebate stay arm – mounting lock

8. Check the mounting of the stay arm.



9. Push down on the lifting mishandling device (if fitted).

10. Move the handle to the turn position.

Turn-Only hardware



11. Install the travel restrictor → *from page 106*.

7.10.4 Mounting the rebate stay arm – mounting lock

⇒ The corner hinge and pivot rest are joined together

⇒ The travel restrictor is not installed yet → *from page 106*

1. Secure the sash to prevent it from falling.



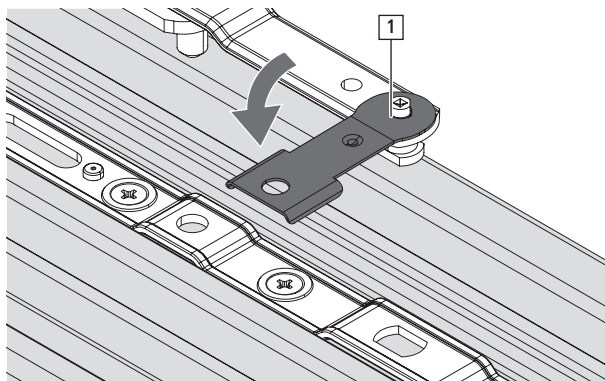
WARNING **Potential risk of death caused by an unsecured sash!**

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

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

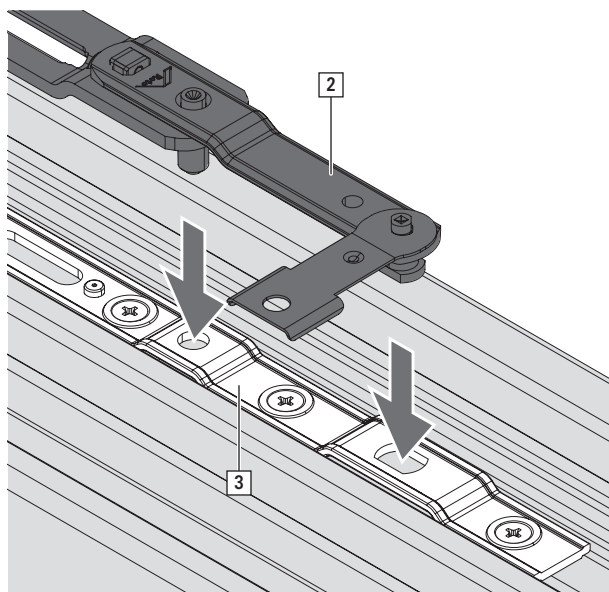
2. Turn the sash and stay arm to 90°.

3. Turn the bayonet bolt 90° using the plate [1], lifting the plate slightly while doing so.





4. Position the rebate stay arm [2] over the stay guide [3] and push it downwards so that the mounting bolt extends into the supporting arm and the bayonet bolt extends into the holes provided.



5. Turn the bayonet bolt 90° using the plate so that the plate engages on the sash stay rod again.



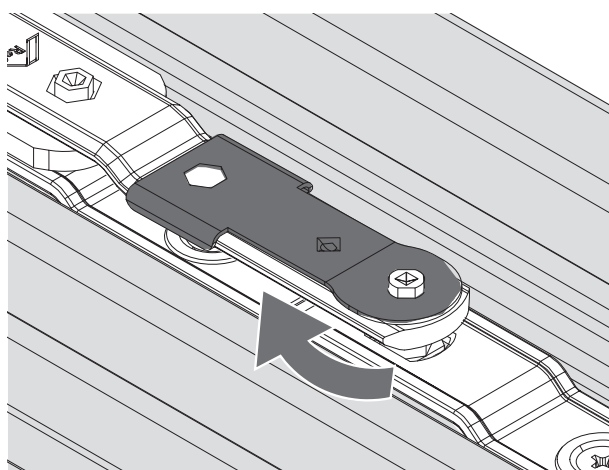
INFO

The plate must be easy to turn. If a lot of force is required or if it is jammed, check the position of the bolt in the mounting plate.

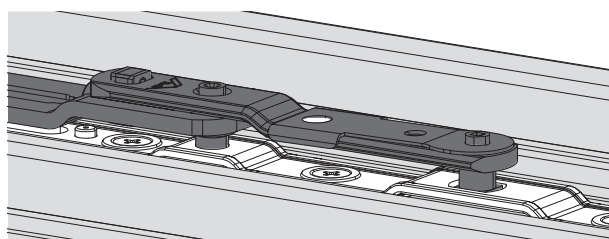


WARNING Potential risk of death caused by the sash falling!

- The sash may fall if the stay arm is not correctly positioned in the stay guide.
- ▶ Check correct mounting.
 The mounting bolt and the bayonet bolt must be locked in the stay guide.
 - ▶ The stay arm must audibly click into place.



6. Check the mounting of the rebate stay arm.



7.10.5 Load transfer

⇒ Sash mounted.

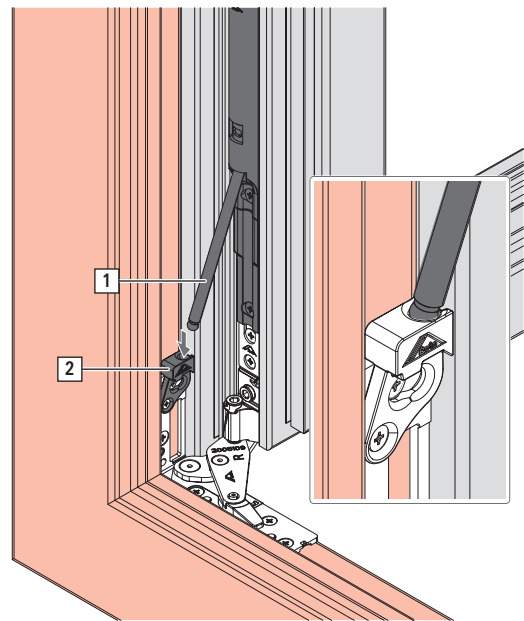
1. Open the sash 90°.

Installation

Joining the sash and frame

Tilt stay

2. Connect the support rod [1] to the sash component and insert into the recess in the frame component [2].



3. Set the load transfer → *from page 121*.

7.10.6 Tilt stay



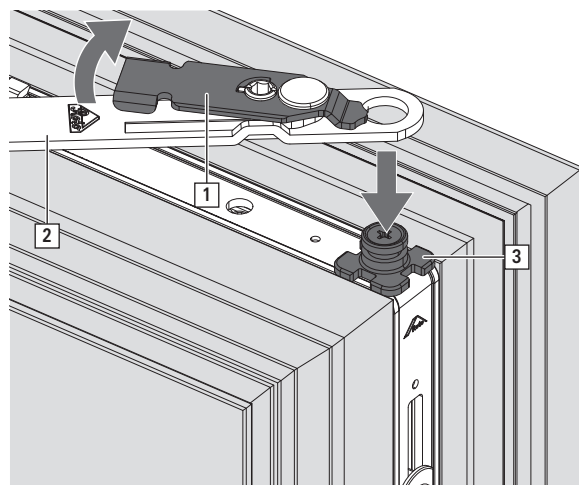
DANGER

Risk of death if the tilt stay does not provide any protection.

If a tilt stay is defective, the limited opening function / opening width can no longer be guaranteed. The window can be opened too far, which can lead to hazardous or life-threatening situations, e.g. falling from the window.

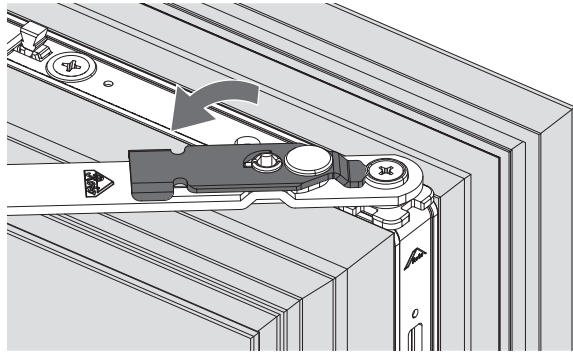
1. Close the window until the repair has been performed.
2. Take the window out of operation, e.g. by removing the window handle.
3. Commission a specialist company to carry out repair measures.

1. Push the locking plate [1] to one side and hold it there.
2. Place the frame component [2] on the sash component [3].

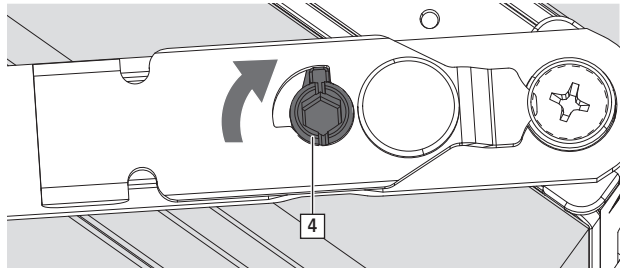




3. Let go of the locking plate. The locking plate automatically snaps back into the initial position.



4. Turn the fixing screw [4] 90°.



5. Check the mounting of the tilt stay.



INFO

Tilt stays do not have a braking effect. The sash can fall shut due to the force of the wind.

7.11 Performance test

Check for proper operation.

A quick performance test must be performed on all elements to ensure that their components fulfil their intended function.

Have malfunctions remedied by a specialist company.



DANGER

Risk of death if the tilt stay does not provide any protection.

If a tilt stay is defective, the limited opening function / opening width can no longer be guaranteed. The window can be opened too far, which can lead to hazardous or life-threatening situations, e.g. falling from the window.

1. Close the window until the repair has been performed.
2. Take the window out of operation, e.g. by removing the window handle.
3. Commission a specialist company to carry out repair measures.

Time

- After production (once the sash and frame have been fully assembled and glazed).
- On site / on the construction site (after the Tilt&Turn element has been fully installed in the masonry).

To be carried out by

Turn-Only hardware

1. Move the sash to the turn position.
2. Check whether the sash is stopped by the tilt stay.
3. Then close the sash.

8 Adjustment



INFO

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



INFO

In order to adjust the

- pivot rest,
- corner hinge,
- sash stay,
- gasket compression at the locking cams,

the tilt stays have to be unhinged so that the sash can be opened to 90°. This work can only be carried out from the outside (e.g. facade lift).

8.1 Locking cam

E cam

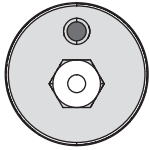
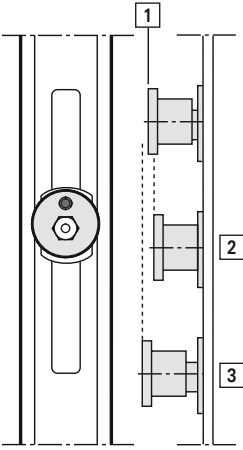
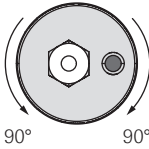
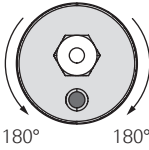
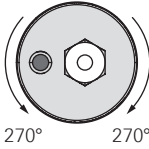
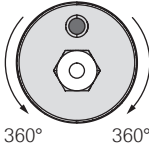
E cam	Adjustment distance	Gasket compression adjustment [mm]	Side view
		±0.8 mm	

P cam

P cam	Adjustment distance	Gasket compression adjustment [mm]	Side view
		±0.8 mm	



V cam

V cam	Adjustment distance	Gasket compression adjustment [mm]	Height adjustment [mm]	Side view
			+1.5 mm -0.8 mm	 <p>[1] 0 = initial position [2] -0.8 mm max. adjustment [3] +1.5 mm max. adjustment</p>
 90° 90°		±0.8 mm	±0.125 mm	
 180° 180°			±0.25 mm	
 270° 270°		±0.8 mm	±0.375 mm	
 360° 360°			±0.5 mm	

8.2 Pivot rest and corner hinge

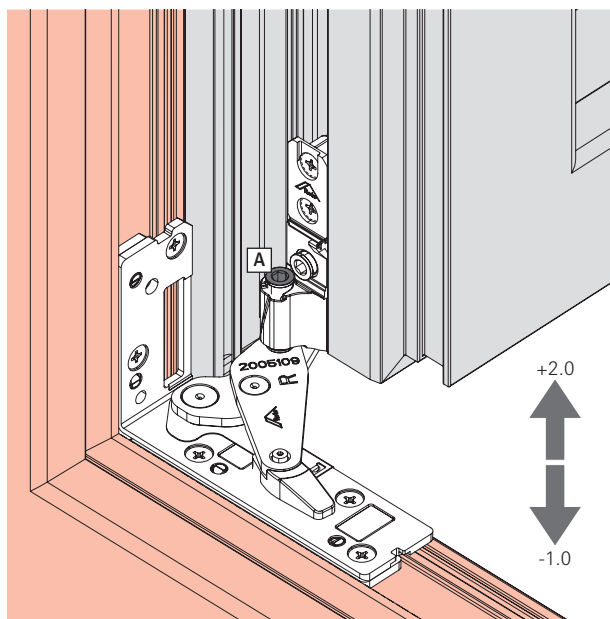


INFO

In order to adjust the pivot rest and corner hinge, the tilt stays have to be unhinged so that the sash can be opened to 90°. This work can only be carried out from the outside (e.g. facade lift).

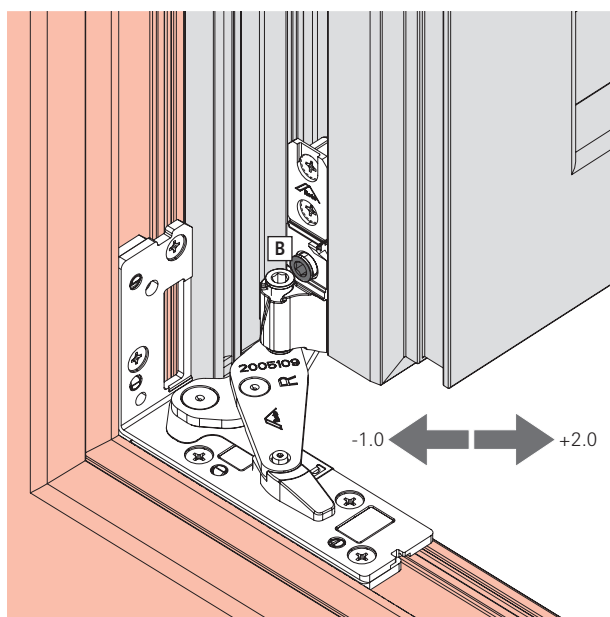
Height adjustment

1. Opening the sash
2. Height adjustment +2.0 / -1.0 mm via screw [A] in the corner hinge.
Tool: 4 mm hex key.



Lateral adjustment

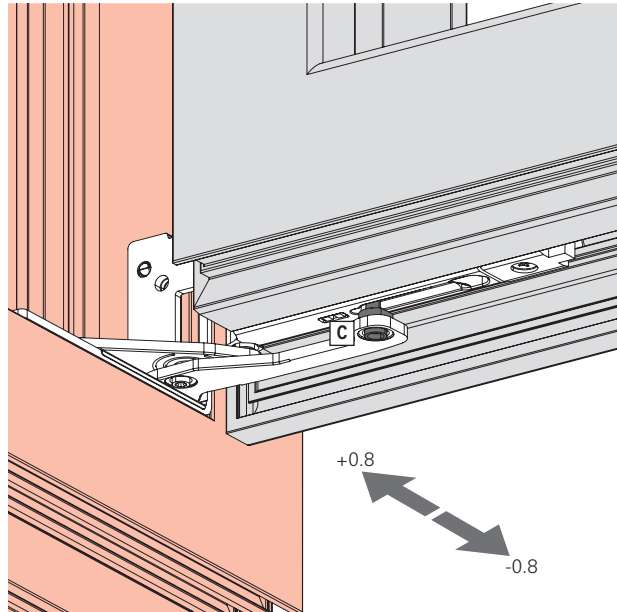
1. Open the sash.
2. Lateral adjustment +2.0 / -1.0 mm via screw [B] in the corner hinge.
Tool: 4 mm hex key.





Gasket compression adjustment

1. Open the sash.
2. Gasket compression adjustment ± 0.8 mm via eccentric [C] in the pivot rest.
Tool: 4 mm hex key.



8.3 Rebate sash stay

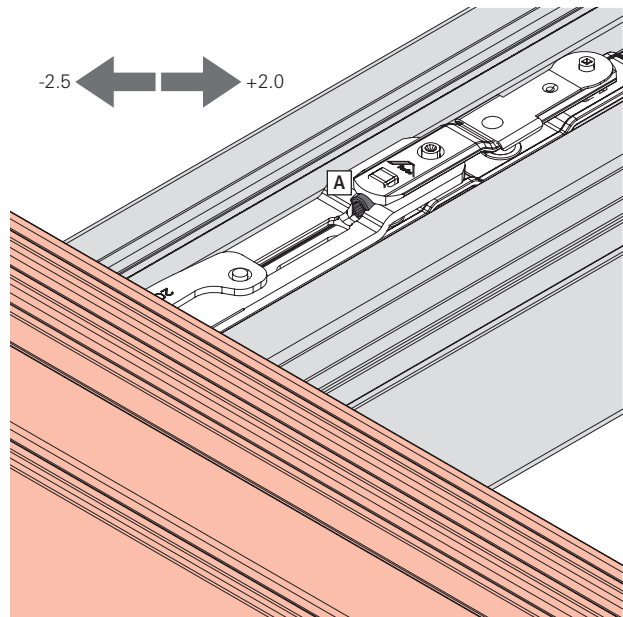


INFO

In order to adjust the rebate sash stay, the tilt stays have to be unhinged so that the sash can be opened to 90°. This work can only be carried out from the outside (e.g. using a facade lift).

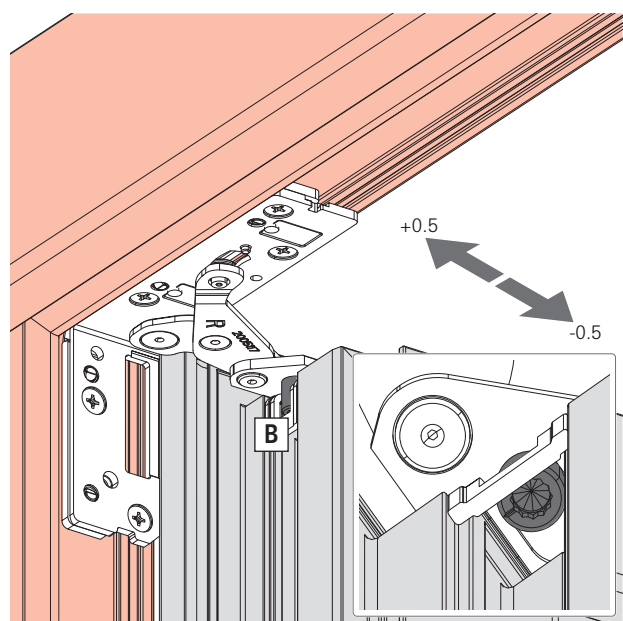
Lateral adjustment

1. Open the sash to 90°.
2. Lateral adjustment -2.5 / +2.0 mm via screw in the rebate sash stay [A].
Tool: 4 mm hex key.



Gasket compression adjustment

1. Open the sash to 90°.
2. Gasket compression adjustment ± 0.5 mm via eccentric [B] in the rebate sash stay.
Tool: 4 mm hex key.

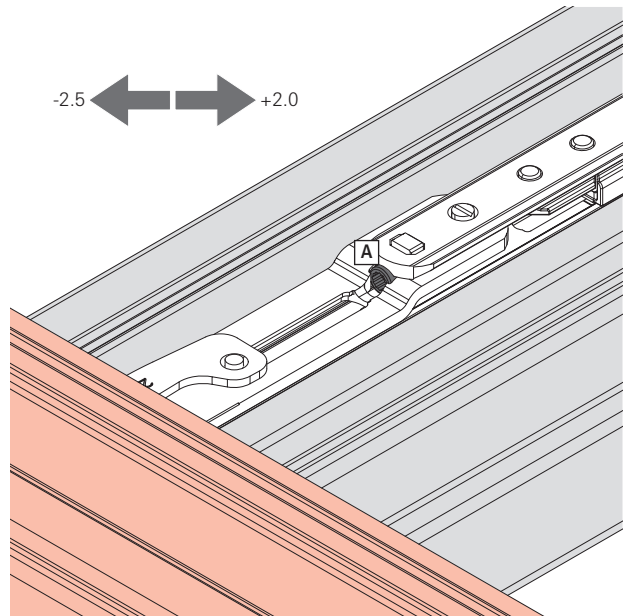




8.4 Sash stay

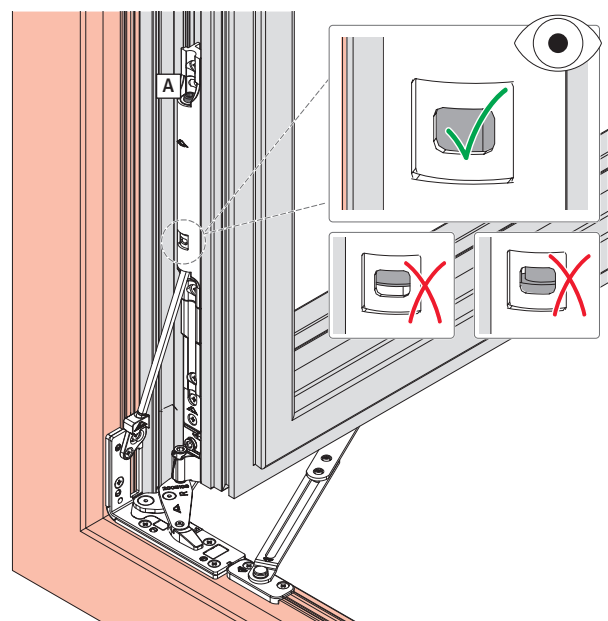
Lateral adjustment

1. Open the sash.
2. Lateral adjustment -2.5 / +2.0 mm via screw in the sash stay [A].
Tool: 4 mm hex key.



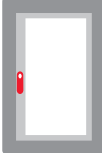
8.5 Load transfer

1. Open the sash 90°.
2. Turn the adjusting screw [A] in until the entire silver screw head can be seen in the inspection window.
Tool: 4 mm hex key



9 Operation

9.1 Windows, outward opening

Handle position	Sash position	Meaning
		Sash in closed position.
		Sash in opening position.

9.2 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.	■
	Sash stay gasket compression is too strong (build-up on gasket).	Adjust the sash stay gasket compression or clean the gasket.	■
	Gasket compression is too strong.	Reduce the gasket compression using the cam setting.	■
Handle cannot be turned 180°.	Sash components hinged or installed incorrectly.	Check the setting in the turn position (potentially rehang – start from the T&T espagnolette).	■
Locking cam is rubbing against the striker.	Incorrect striker position.	Adapt the striker position.	■

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

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



10 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 123
Cleaning		→ from page 124
Clean hardware	☐	
Care		→ from page 124
Lubricate movable parts	☐	
Lubricate locking points	☐	
Performance test		→ from page 126
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 126
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

10.1 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.

10.2 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. → 10.3 "Care" from page 124
- ▶ Apply a thin protective film to the hardware, for example using a cloth soaked in oil.

10.3 Care



ATTENTION

Using incorrect lubricants may cause property damage.

Substandard lubricants can prevent the hardware from working properly.

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



ATTENTION

Cleaning agents and lubricants may pollute the environment.

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

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

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

Recommended lubricants

- Roto NX / NT grease
Material number: 782881



INFO

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

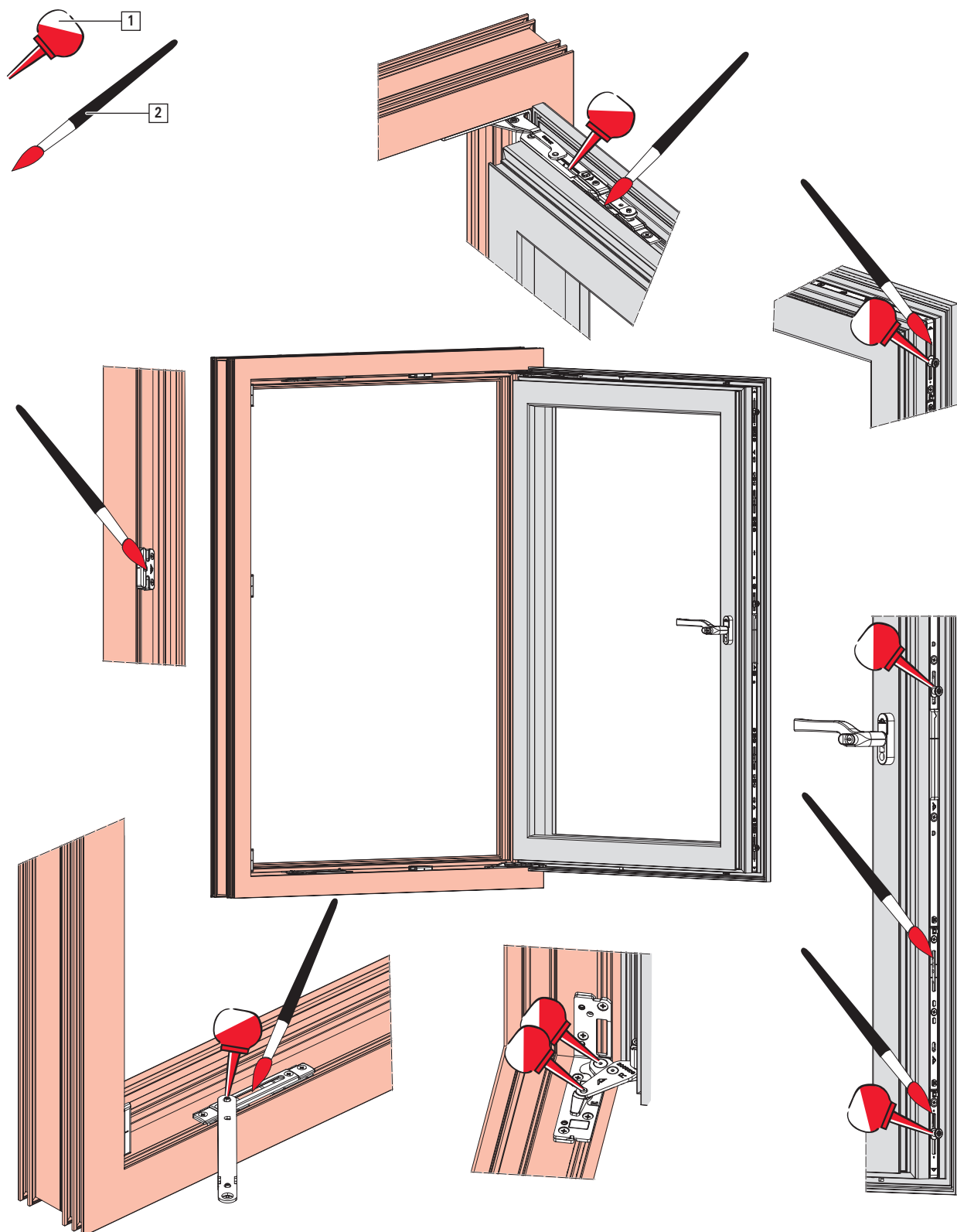


10.3.1 Lubrication points



INFO

In order to regrease the pivot rest and stay bearing, the tilt stays have to be unhinged so that the sash can be opened to 90°. This work can only be carried out from the outside (e.g. facade lift).



[1] Oil

[2] Grease

10.4 Performance test

Check for proper operation:

- ▶ Inspect hardware components for damage, deformation and a secure fit.
- ▶ Check that windows or balcony doors run smoothly by opening and closing them.
- ▶ Check the window or balcony door gaskets for elasticity and fit.
- ▶ Check closed windows or balcony doors to ensure that they are tight.
- ▶ Locking and unlocking torque max. 10 Nm. The test can be performed using a torque wrench.

Have malfunctions remedied by a specialist company.

10.5 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.



11 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.

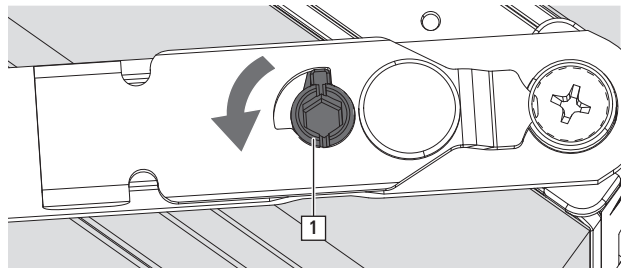


INFO

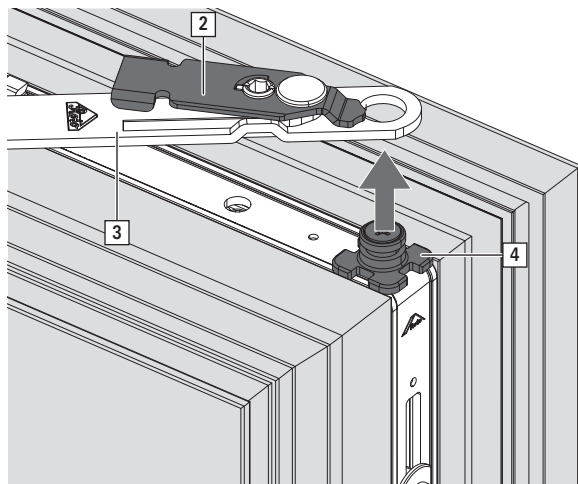
Dismantling can only be carried out from the outside (e.g. using a facade lift).

11.1 Tilt stay

1. Turn the fixing screw [1] 90°.



2. Push the locking plate [2] to one side
3. Remove the frame component [3] from the sash component [4].



11.2 Unhinging a sash without load transfer



INFO

With a rebate sash stay, it is not necessary to remove the travel restrictor or to turn the handle to the tilt position.

⇒ The travel restrictor has been removed → *from page 106*

1. Move the handle to the turn position.

Turn-Only hardware



2. Open the sash.

3. Push down on the lifting mishandling device (if fitted).

Move the handle to the tilt position.

Turn-Only hardware



INFO

Under normal circumstances, this constitutes incorrect operation of the hardware, but it is a necessary step in this case.

4. Secure the sash to prevent it from falling.



WARNING

Potential risk of death caused by an unsecured sash!

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

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

5. Unhinge the sash stay → *from page 131*.

Unhinging the rebate sash stay → *from page 132*

6. Push down on the lifting mishandling device and move the handle to the turn position.

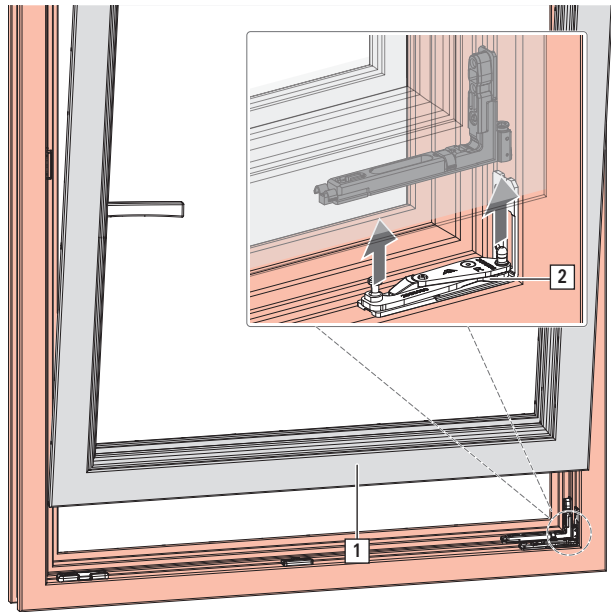
Turn-Only hardware



7. Close the sash.



8. With the sash [1] slightly tilted, lift it out of the pivot rest [2].



11.3 Unhinging a sash with load transfer



INFO

With a rebate sash stay, it is not necessary to remove the travel restrictor or to turn the handle to the tilt position.

⇒ The travel restrictor has been removed → *from page 106*

1. Move the handle to the turn position.

Turn-Only hardware



2. Open the sash.

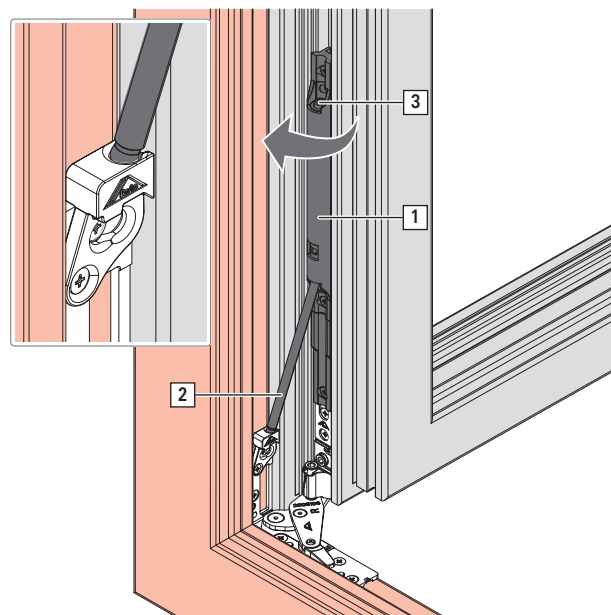
Relieve the load on the load transfer [1] until the support rod [2] lies loosely in the frame component.

To do so, unscrew the load transfer adjusting screw [3] until the spring is fully released (the support rod becomes loose).



INFO

If the spring is not fully released, the sash cannot be rehinged.



3. Remove the support rod from the recess in the frame component.
4. Push down on the lifting mishandling device (if fitted).
Move the handle to the tilt position.

Turn-Only hardware



INFO

Under normal circumstances, this constitutes incorrect operation of the hardware, but it is a necessary step in this case.

5. Secure the sash to prevent it from falling.



WARNING

Potential risk of death caused by an unsecured sash!

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

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

6. Unhinge the sash stay → *from page 131*.
Unhinging the rebate sash stay → *from page 132*

7. Push down on the lifting mishandling device and move the handle to the turn position.

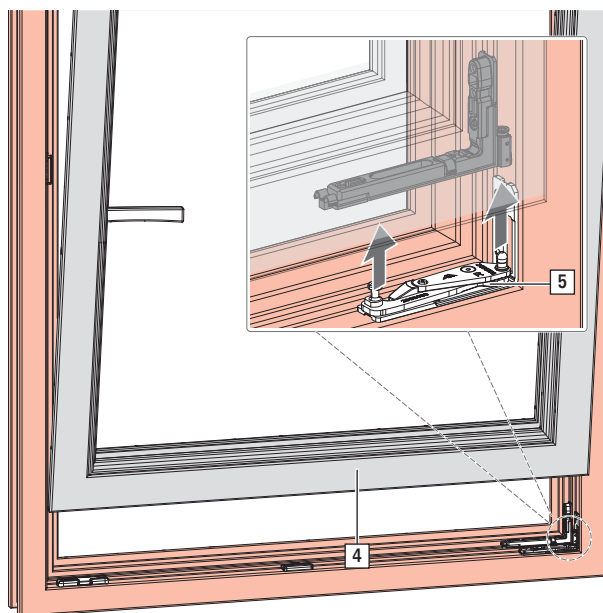
Turn-Only hardware



8. Close the sash.



9. With the sash [4] slightly tilted, lift it out of the pivot rest [5].



11.4 Unhinging the sash stay

⇒ The travel restrictor has been removed → *from page 106*

⇒ Sash is in the tilt position.

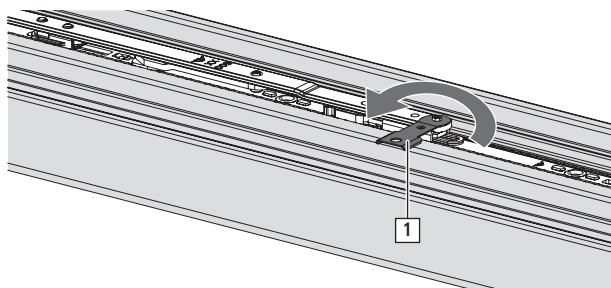
1. Turn the bayonet plate [1] 90° while lifting it slightly.



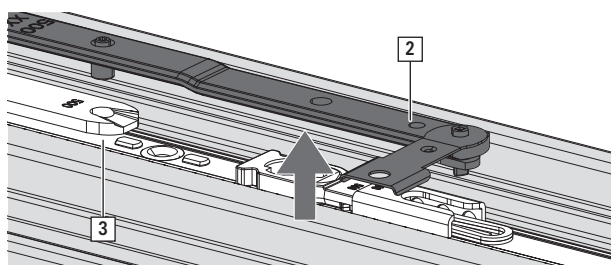
WARNING **Potential risk of death caused by an unsecured sash!**

The sash may fall during dismantling if it is no longer connected to the frame.

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



2. Detach the stay arm [2] from the stay guide [3].



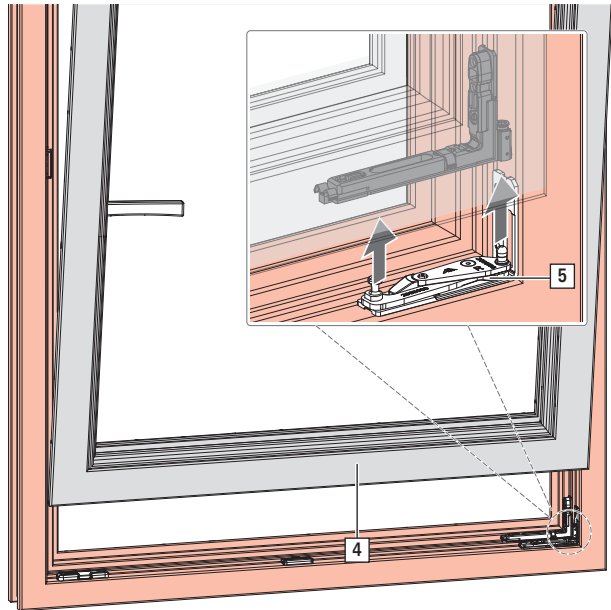
3. Push down on the lifting mishandling device (if fitted).

4. Move the handle to the turn position.

Turn-Only hardware



5. Close the sash.
6. With the sash [4] slightly tilted, lift it out of the pivot rest [5].



11.5 Unhinging the rebate sash stay

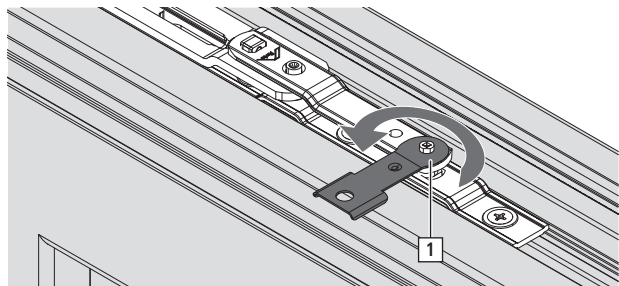
1. Turn the bayonet plate [1] 90° while lifting it slightly.



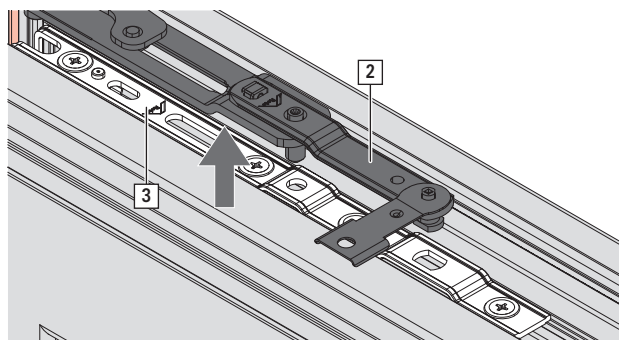
WARNING
Potential risk of death caused by an unsecured sash!

The sash may fall during dismantling if it is no longer connected to the frame.

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



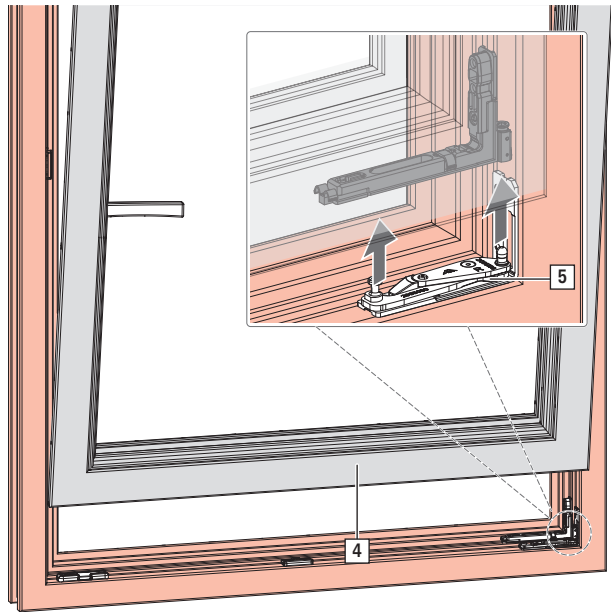
2. Detach the rebate stay arm [2] from the rebate stay guide [3].



3. Close the sash.



4. With the sash [4] slightly tilted, lift it out of the pivot rest [5].



11.6 Hardware components

Removing hardware components

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

12 Transport

12.1 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 transport. 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.

12.2 Storing the hardware

Store all hardware components as follows until they are installed:

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

13 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.

13.1 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.

13.2 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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